

# Radio Control **CAR ACTION**

THE WORLD'S LEADING R/C MAGAZINE

47380

**WIN BIG!**  
HEAVY-HORSEPOWER  
SWEEPSTAKES

May 1997

**14**  
PAGES  
OF USEFUL  
HOW-TO'S!

**PAINT AND DETAIL  
LIKE A PRO**

**GET STARTED IN  
DRAG RACING**

**GEARING TIPS FOR  
BEGINNERS**

**MRC**  
**Ironman**  
**Monster**  
**Truck**  
pg. 80

**YOUR PICKS!**

**1997 TOP 10**

- CARS • TRUCKS • TIRES
- DRIVERS • MOTORS
- CHARGERS • RADIOS • BODIES
- BATTERIES • SPEED CONTROLS

pg. 108 **PLUS** TOP 10 R/C INNOVATIONS



**Wild home-built  
tractor-trailer**

**Kyosho's hot  
new Mantis cars**

**Quarter-scale  
stockers on the move!**



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# Radio Control CAR ACTION

VOLUME 12 NUMBER 6 • JUNE 1997



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page 96

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ON THE COVER (from top to bottom): Team Associated's new Gas Dual Sport (photo by John Howell); HPI's Nitro RS4 (photo by John Howell); Modified Traxxas Nitro Stampede (photo by Walter Sidas).



## Glow to Go!

**L**AST MONTH, I mentioned that glow-powered touring cars are all the rage in Japan and that it might not be too long before they became popular here in the States, too. Well, my prediction was accurate, and I'm pleased to say that nitro tourers are here now and they look hot, hot, hot! The newest entry in the nitro parking-lot scene is the HPI Nitro RS4. HPI did this one right, and cost-cutting measures such as bushings and plastic shocks bring the price of this kit within reach of most budget-conscious racers. The early word is that it has created

quite a stir in the industry and that racers across the country are clamoring to get their hands on it. Interested to see what the hype is all about? Turn to page 64 for a closer look.

Another car that will surely spark interest among parking-lot glow enthusiasts is Team Associated's GDS (Gas Dual Sport). Associate editor George Gonzalez spent some time

with an early prototype, and it rips! If this preproduction unit gives any indication as to how the final version will run, we're confident that many nitro maniacs will soon be happily tearing up parking lots with it. Coincidentally, as I write this, I'm looking across my desk to where a highly modified Kyosho Nostalgic Series GP 10 sits patiently waiting for fuel so it, too, can join in the fun. Stay tuned; we have plans for this hot ride in another place and at another time ....

Nitro isn't just for the parking lot. We're reminded of that when we read Peter Vieira's review of the Thunder Tiger Pro Thunder stadium truck and associate editor George Gonzalez' awesome "Second Look" article on his Traxxas Nitro Stampede—giddyup!

So, what if nitro doesn't turn your head? Well, all you crazed electric fans should hold on tight. We have some sizzling off-road racing action, a plethora of product reviews and in-depth "Thrash Tests" on Tamiya's latest "cost-conscious" tubbed-out TA03F and highly detailed Williams Renault F1 racer.

### Grassroots Redesign

If you've an eye for detail, you'll notice that our "Grassroots

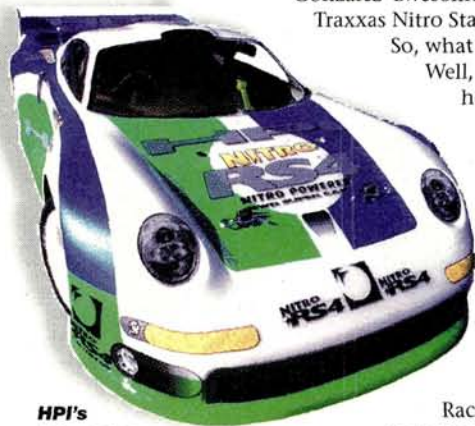
Racing" department has undergone a makeover to enhance its visual appeal. As

always, this department provides exposure for club races and fun-type events. If you'd like to see your club's next big race in print, send a few photos and words to "Grassroots Racing," c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606.

What are you waiting for? Don't just sit there; start turning pages!



**Team  
Associated's  
GDS**



**HPI's  
Nitro RS4**

Frank Masi, Executive Editor

# Radio Control CAR ACTION

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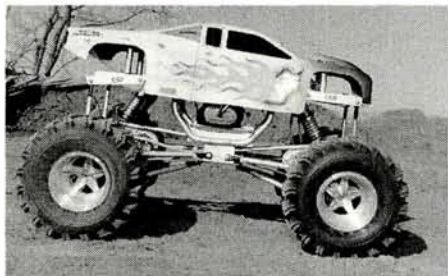




## LETTERS

### Give us those Big Trucks

I bought a Tamiya Grasshopper over a year ago and have been cleaning it up. Because I can't find replacement tires, I wonder if anyone makes rims that will fit my car and will accept a wider variety of tires. I also wanted to know if John Howell will be doing another "Project Big Truck," since ESP has come



out with the Clodzilla 4 Pro. Will ESP make a chassis for the Traxxas Stampede since they are already making aluminum bumpers and nerf bars? Thank you for your time.  
**OMAR PARADISO**  
**Rochester, NY**

Omar, thanks for the letter. I've seen a lot of Tamiya Grasshoppers with larger, racing-truck wheels and tires installed in place of the stock buggy wheels and tires. Tamiya Blackfoot wheels can be bolted right onto the Grasshopper without any modifications. The Blackfoot wheels come in metric measurements; however, most 2.2-inch racing-truck tires will fit the Blackfoot perfectly. If you make the swap, you'll

be able to find replacement tires much more easily and your truck will have more curb-hopping ground clearance than before.

John Howell's long-awaited "Project Big Truck, Part 3" article is in the works. And you're in for a treat, my friend; this is the meanest monster truck I have ever seen. Aluminum everything and twin Aveox brushless motors; my God, has John lost his mind? Everyone in our office (except John) is afraid of this truck. It's not surprising, though; John has a funny way of soothing the savage beast, and besides, he always keeps his Clod on a short leash. Look for this feature in an upcoming issue. As for your Stampede inquiry, stay tuned. Something is in the works at ESP. —George

### Port and Polish

In your April issue there's an article on championship-winning setups for Richard Saxton's RC10GT, and it says the engine was ported by Curtis Husting. What exactly does "ported" mean, and how does it affect performance? Thanks for your time.

**MIKE**  
**via the Internet**

Basically, Mike, when you port and polish an engine, you slightly enlarge the intake port on the crankshaft—and the engine's exhaust port—with a Dremel tool or other type of rotary grinder. Then you polish each port until it's completely smooth. Porting jobs range from mild to wild, and porting and polishing an engine coaxes more horsepower out of it—sometimes, a lot more!

In our January 1994 issue, we published an article that highlighted the basics of porting and polishing an O.S. CZ-R. That article explained the procedures in detail. Here's a small warning to all you nitro maniacs out there, though: porting and polishing an engine is an exact science. If you

break out your Dremel and just start hacking away inside your engine, there's a good chance it may never again run properly (or at all). I highly recommend that anyone interested in porting an engine give Ron Paris a call. If anyone out there deserves the title "king of engines," it's Ron. You can phone him at (909) 465-1189 or fax him at (909) 465-0089. —Doogie

### The Next Fad?

It seems that you guys at *Radio Control Car Action* always spot upcoming trends and fads a mile away. Not too long ago, you ran an article on rally car conversions, and now my local track is flooded with them. A while back, you printed articles on touring cars and parking-lot racing, and now that has exploded around here bigtime. My question is, what's the next "big thing" in R/C going to be? I want to beat my racing buddies to the punch!

**FRANK SIMONE**  
**Poughkeepsie, NY**

Ah, the crystal ball is becoming clear now, Frank ... I see ... I see ... a four-wheel-drive buggy on a pit table. Yes, that's it. And now I see full four-wheel-drive starting grids at local tracks across the country. I see many of them. There are Yokomos, Schumachers and especially the all-new Losi XX-4. Wait; what's that I hear? Oh, it was just the whine of a Predator car going by. Sorry about that. Yes, Frank, four-wheel drive will undoubtedly be THE next big thing to hit the R/C world. It's going to happen, so keep an eye on your local off-road track. Oh, and by the way ... you owe me \$19.95 for tapping into my psychic hotline. —Doogie

### Who's MPH?

I just read the article on dischargers (April '97). It is one of the most helpful articles that your magazine has ever done. On

your recommendation, I would like to buy the MPH Products Packrat. However, the address and phone number do not appear in the index as stated. I would be very grateful if you could get me their number and/or address.

**BOB CANORRO**  
**via the Internet**

Sorry, Bob. Here's MPH's address and phone number: MPH Products, 10446 N. Magnolia Dr., Mequon, WI 53092; (414) 241-9696. Good luck with the Packrat. I'm really pleased with mine!  
—George

### Liquid Rubber?

Love your new column, "Concours Corner." After reading the article on "Dressing Up Your Chassis" in the March issue, I went to work on my RC10L20. I followed your advice on how to wire neatly and the chassis does look far more professional now. I received the April issue and was extremely disappointed when I noticed that "Concours Corner" wasn't there. Was that a one-shot deal, or what? Also, where can I get my hands on that Starbrite Liquid Electrical tape? It looks really cool, but I can't find it anywhere.

**JEFF MARCY**  
**Richmond, VA**

Hey Jeff, "Concours Corner" is a bimonthly column. We may eventually go monthly, but that will depend on our readers and how they take to it. In the meantime, rest assured that it will appear every other month. Starbrite Liquid Electrical tape is awesome stuff. You can find it at True Value Hardware, ACE Hardware, NAPA Auto Parts Stores and many Kmart stores (in the sporting goods dept.). If you still have trouble finding it, call Starbrite at (800) 327-8583. Good luck.

—George

**WRITE TO US!** We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters and emails we receive, we can't respond to every one.

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In search of fun  
and glory, 'cause  
life's too short  
to be a sheep • by Chris Chianelli

# INSIDE Scoop



## South Seas Showdown

I've just returned from the Kyosho World Cup in the Philippines, and I'm telling you now, this was the all-around coolest race I've ever attended. Imagine Ferraris, Daytona Cobras, Ford GT-40s, Europas and Corvettes from Kyosho's Nostalgic Series power-sliding through the turns on the gorgeous track you see here. Add to that the sound of 2-speed trannies up- and down-shifting, and the excitement was almost more than I could take! The racing was very evenly matched, and the cars ran much more dependably than I expected. During the entire two days of racing, I counted only two flame-outs. And the Filipino women! Oh, wait, never mind. You'll have to wait for my full report in the August issue! Ha, ha ... too bad!!



## Sedan Specific

Rumor has it that Reedy's new Tri-Sonic "Y" 10-turn triple motor is doing great things on the racing scene in Japan. This could turn out to be the terror of the touring-car circuit. Specifically designed for the sedan car, the hand-wound "Y" has a small commutator, straight-shank armature, zero-gravity epoxy-dipped and baked armature, dual balancing (epoxy and drilled) and 737 long-life brushes with heat-resistant copper springs. The "Y" will probably have been thoroughly tested and will be available here in the States by the time you read this. Stay tuned to *Car Action*. For more info, contact Associated Electronics, 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.



Looks to me as if the Traxxas R&D guys are having fun finding new ways to put their TRX Pro-15 engine to work. This 1/10-scale wheelie-popping creation features a specially designed, adjustable clutch and a new locking rear end for super-hard, super-realistic launches. Power is from a stock TRX Pro-15 engine equipped with an extra-long, torque-producing tuned pipe. I'm told the wheelie bar is definitely required to prevent it from completely flipping over. The Texas Motorplex—one of the fastest drag-racing tracks on the NHRA circuit—is right up the highway from Traxxas. Do you suppose there's a connection? So far, this '40 Ford dragster has no name; got any ideas? Stayed tuned to the "Scoop" for more details, or contact Traxxas Corp., 12150 Shiloh Rd., #120 Dallas, TX 75228; (214) 613-3300; fax (214) 613-3599.

## Lone Star Pro Stock





## INSIDE **scoop**

### A Better Handling Dual Sport

I know, I know .... Some of you guys are probably asking right now, "Why is Chris putting boring hunks of blue foam rubber in the 'Scoop'?" No, I haven't lost it yet—not completely. The reason is simple. These Associated Firm Foam Inserts are probably the first thing you should change on your Associated Dual Sport. Guys have been complaining about difficulties getting the stock tires to hook up properly. In most cases, their

problem is caused by the soft inserts the kit comes with; they don't provide adequate sidewall support. Toss them, install these firmer ones, and see the difference. I hope I saved you the cost of a new set of tires.



**1500**  
1/2 U.S. GALLON  
15% Nitro  
18% Oil

### No Secrets Here

Byron Original's new 1/2 gallons of RACE fuel are here. Raw-material selection and handling can be just as important to the quality of a fuel as the fuel formula itself. According to Byron, this brand-new RACE fuel uses only competition-grade methanol and 99-percent-pure nitro-methane and was specially formulated for R/C cars—sport and racing. They further contend that the raw-material storage and the blending of RACE fuel take place under a special protective blanket of nitrogen to ensure moisture-free ingredients. Computer-controlled metering guarantees consistency from bottle to bottle. Here's the part I really like: that little black label indicating oil content—in this case, 18 percent, which complies with O.S., Thunder Tiger and many other well-known manufacturers' specifications. The 18 percent is an 80/20 mix of RACE synthetic and castor, which comes out to 14.4 percent and 3.6 percent of total volume, respectively. Byron also offers a 12-percent-oil content, which is a 60/40 (10.8 percent and 7.2 percent) blend of synthetic and castor. Byron feels a little extra castor means extra protection for the rigors of racing. I agree. Some fuel manufacturers may keep their oil content a closely guarded secret; that's their prerogative. But never forget that you're the customer, and you have the right to know what's passing through your expensive engine. I salute Byron for this move. For more information, contact Byron Originals Inc., P.O. Box 279, Ida Grove, IA 51445; (712) 364-3165; fax (712) 364-3901 or 2028.

# TRINITY

# ZERO

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Our 128 Tooth Spur Is Lighter Than Most 100 Tooth Spur Gears!



## Choice of Champions

At the '97 Winter Champs, all top 10 finishers in 2WD Stock, 2WD Modified, Truck Modified and 4WD Modified used Pro-Line's Holeshot tires for additional traction on the slick track. Mark Pavidis—2WD top qualifier and winner of this major event—used Pro-Line tires on his Associated B2: the new 2.2-inch 4-rib tires in M3 compound up front and Holeshot tires in M3 compound at the rear (with 2.2 wheels). In fact, 10 of the 10 buggies in the 2WD A-Main used Holeshot tires in M3 compound, and all five Associated A-Main drivers used Pro-Line's 2.2-inch 4-rib fronts and new 2.2-inch rears on their B2 2WD buggies. Whatever you Pro-Line guys are doing at the Southern California Wheel & Tire Skunkworks, all I can say is ... just keep on doin' it!



## PSE Phaze 1

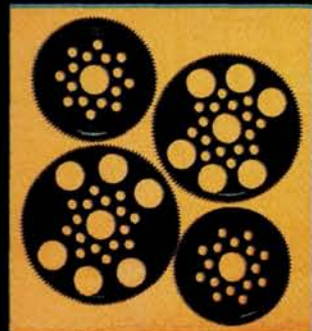
*"The world's fastest factory Modified Oval car ..."*

... according to its manufacturer, Parma Intl. The radical new PSE 1/10-scale Phaze 1 chassis won the Factory Modified A-Main, TQ'ed and set a new track record at the Dominguez Hills, CA, Velodrome. The first PSE car release took the oval-racing world by surprise with its excellent cornering. The design incorporates adjustable rear-roll steer and seven battery slots to allow adjustable weight distribution. Phaze 1 features: 100-percent aerospace-grade graphite chassis, battery brace, cross-brace, pivot brace and top and bottom pod plates, front and rear PSE Velocity wheels and tires, I.R.S. Pro differential and clamping left hub, Wolfe progressive front suspension, Delta triple shocks with Wolfe springs, Associated Dynamic front suspension, full ball-bearing set and ROAR national champion PSE Pontiac Grand Prix Lexan body. For more information, contact Parma Intl., 13927 Progress Pky., N. Royalton, OH 44133; (216) 237-8650; fax (216) 237-6333.

# FRICTION

## SUPER GEARS™

- New Super Low Drag Narrow Tooth Design •
- Graphite Filled For High Tooth Strength •
- Super True, Super Light, Super Quiet •
- 84 & 87 Tooth Sizes For Losi XX-CR & XXT-CR •
- 95, 100, 120, & 128 Tooth For On-road Racing •
- Dual Diff Ball Holes For Stealth & Corally Diffs •

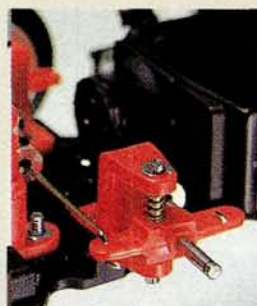
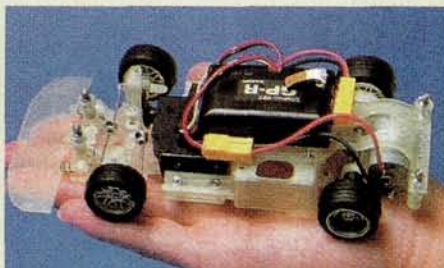




## the ON-TOUR Touring Car

As you can see, the Kawada Tripmate is small enough for you to take some R/C racing fun with you wherever you go. The Tripmate has a battery duration of about 8 minutes and can be run in very small areas where  $\frac{1}{10}$ -scale cars can't. Some of its most interesting features are a spring-cushioned bumper, an invisible body-mount system and a wheelbase and track that may be adjusted to fit a variety of bodies that are offered. A Supra body and a motor are included in the kit. A combo servo/ESC/receiver (AM 27MHz) and batteries, charger and bearings are also available. This thing is so cool and different that I think I might have to review it myself, and Frank, Doogie and George get nothing!—nothing!—NOTHING! ... Sorry, innovative R/C stuff like this tends to get me stressed-out and very nervous!

For more information contact Sunrise R/R Ltd., 1703 Utah St., Milton, WA 98354; (206) 874-8508; fax (206) 838-7603.



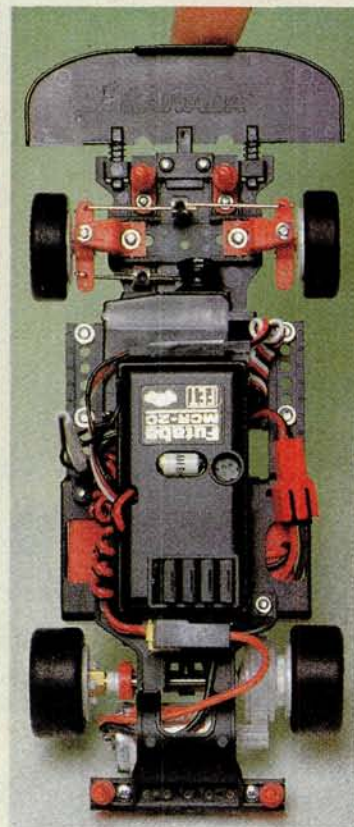
Above: the  $\frac{1}{24}$ -scale Tripmate M-24 (in prototype clear).

Many of its features result from its size.

Left: the M-pack Ni-Cds have their own compartment.

Bottom left: scaled-down pan-car-style kingpin front suspension.

Right: note integrated receiver/ESC unit and direct-drive ball diff.



For those of you who are hungry for something big, S.E.I. Racing should have just the thing.

The FG Modellsports Mercedes Race Truck is based on their 34-inch-long, 22.5cc

Zenoah gas-ignition-powered (with pull-starter)  $\frac{1}{6}$ -scale chassis. The truck is reported to

exceed 45mph and have run times of one hour.

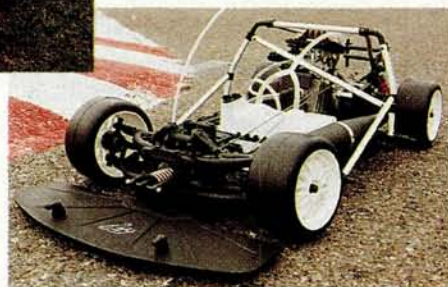
Like the Mercedes truck, the  $\frac{1}{6}$ -scale FG Modellsports off-road buggy is also capable of 45mph and has a one-hour run time. Features include ball bearings, a Zenoah engine, oil-filled long-reach shocks and a gear differential.

FG's  $\frac{1}{6}$ -scale on-road car, which was recently updated, includes a new suspension and chassis and new German-built Solo gas-ignition engine. S.E.I. offers 14 scale bodies for the on-road chassis.

High-performance options are available for all FG Modellsport vehicles, which come 99-percent built. Contact S.E.I. Racing, 14836 31st Circle, Redmond, WA 98052; (206) 556-9090; fax (206) 556-9292.



Racing  
**Large**  
from FG Modellsports





"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. If we choose to feature your creation, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the seventh annual "Readers' Rides of the Year Contest" in the fall of 1997. The winner will be awarded \$500 and an assortment of electronic R/C equipment furnished by Novak Electronics Inc. Our second and third choices will also receive an assortment of Novak Electronics R/C equipment. In case we need to contact you, write your address and phone number on your letter and on the back of every photo you send. Good luck!



temperature gauge. The Bug sports an HPI .15 engine, MIP Stinger pipe, titanium turnbuckles, A-Main racing chassis and Futaba radio gear. The two friends, Guido tells us, are constantly improving and tweaking their rides!

## STOP THE MADNESS

"There is no end to this insanity," says Guido Medeiros' fiancée. Of course, she's talking about the buggies and trucks Guido and his friend Kurt Koenig have built and run. The Parma '57 Chevy is equipped with an O.S. CV 12 engine, Paris pipe, titanium turnbuckles and MIP



## KICKIN' BACK IN THE FAMILY WAGON

Eric Ortiz of Brooklyn, NY, relaxes after work or school by working on his Kyosho TF-2 Type R which is equipped with full ball bearings. His wagon is decked out with HPI rims, Pro-Line tires, a Trinity SpeedGems Onyx 13-turn double motor and he powers it with a Novak Rooster Duster ESC and 1500 SCR Sanyo batteries. For full control, he drives it with a Futaba Magnum 2PC radio system. Eric, you have a lot more than an ordinary wagon on your hands!



## FATHER/SON TRUCK

Duane Storey of Massillon, OH, bought this Tamiya Clod Buster so he could share building it with his son, Nicholas.

They built the truck stock for now, but they're pleased with its out-of-the-box power, size and looks. Controlling it is a Futaba Magnum Sport 2PC radio. Looks like a mean stock machine and a great father/son project to us, Duane!



## PRACTICE MAKES PERFECT

This is just one of the good-looking cars that Mark Allgeyer of Lake St. Louis, MO, sent photos of. His Losi Double-XT is equipped with MIP CVDs, BB steering, aluminum top shaft and motor plate and Lunsford turnbuckles. He runs it with a Novak Tempest speed control and a Trinity Midnight motor. Mark topped off his ride with a Hot Bodies body, which he airbrushed himself. He tells us that he races off-road at Dirt Burner's Hobbies in Kirkwood, MO, and admits that he "can't race worth beans, but tries to look good doing it!" Our only words for you, Mark: practice, practice, practice ...



## READERS' rides

### MIXED-UP OVAL RACER

Tony Ingalls of Riverdale, GA, combined parts from an Associated RC10LSO with a Wood X-13 chassis to make his oval car. He uses Powertron 1700 batteries and a Tekin 411 P2 ESC for one mixed up, fixed up oval racer. He controls it with a Futaba Magnum FM radio (because he thinks "fancy radios are for brain surgeons"), and it rolls along the pavement on BSR featherlight Green compound radials. He topped it off with a Bolink '96 Grand Prix body. Hope the combination of oval racers gives you a speed demon, Tony!



### ROCK HOPPER

It looks as though Estevan Sanchez of Albuquerque, NM, has quite a monster on his hands with this Tamiya "Bear Whiz Beer" Clod Buster. To make it traverse stumps and rocks flawlessly, he runs two, 17-turn Sapphire motors, a Tekin Titan ESC and Futaba radio gear. For better night visibility, he put four working lights on the roll bar and headlights up front. The guy at the wheel? Estevan tells us, "He-Man is the buff driver!"



### 6-WHEEL TERROR

David Furst of Sebastopol, CA, sent us photos of his DTZ Double Truck Zilla. By grafting together two Team Associated RC10GTs, David was able to make this sick-looking "four-wheel-drive" monster. It features an engine starter, MIP purple stinger pipes and Lunsford titanium turnbuckles. For clearance, he angled the front pipe out at 90 degrees, and the truck is silly fast! David loves the sound at full throttle, and he thinks it "handles sweet" with 0-degree rear toe-in and 10-degree caster blocks. With six on the ground, this monster will tackle any terrain!



### DIFFERENT TOPPINGS

Benjamin Wang of Irving, TX, has a Tamiya TA02 chassis on which he interchanges six bodies for a different, sleek look each time he goes to the parking lot! He started with a FWD configuration and runs it stock, except for the addition of Trinity's Midnight motor. He powers it with a Novak 610 speed control. Shown here is the Blitz Skyline body Benjamin designed and painted himself. He'd like to acknowledge his friend Robert Gries for helping him with the photography.

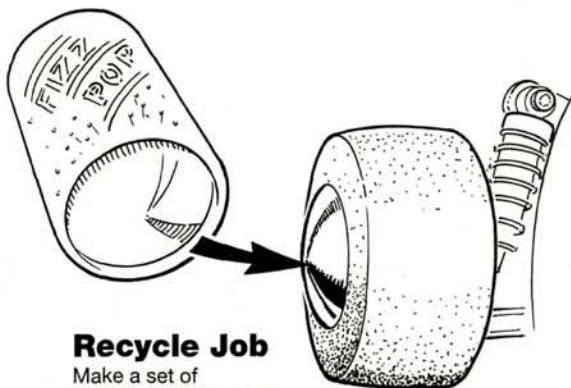
**NOVAK**  
ELECTRONICS, INC. RACING TEAM





## PIT TIPS

by Jim Newman



### Recycle Job

Make a set of aerodynamic hubcaps by cutting out the dome-shaped bottom from a cleaned soda can. Polish or paint to trim your ride and fit them into your wheel rims, using a little Shoe Goo or PFM to secure them. To avoid being cut, sand the sharp edges of the aluminum.

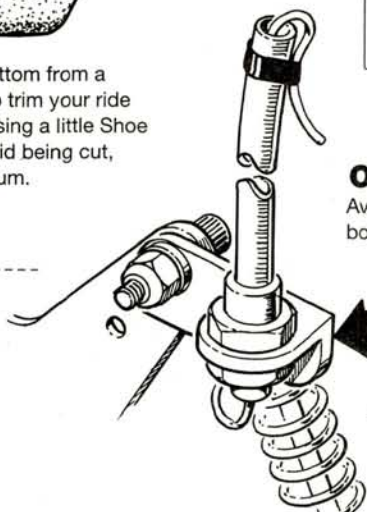
**JAMES STAMP**  
Chattanooga, TN



### Color-Keyed

Put dabs of differently colored paint on the end of your Allen keys to easily tell them apart.

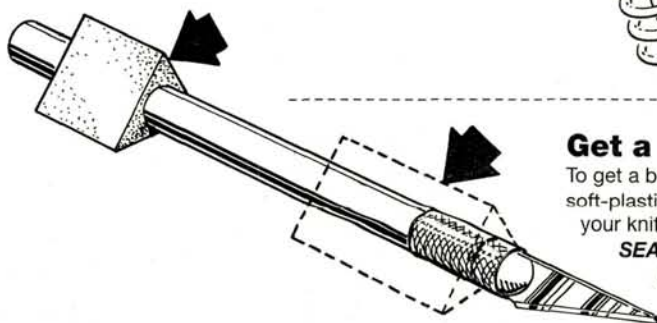
**TOMMY FATOUT**  
Littleton, CO



### Outside Chance

Avoid drilling an antenna hole into the body of your car by mounting the antenna bracket on the top of a shock tower. Be careful to route the antenna wire away from where it might be pinched by the suspension.

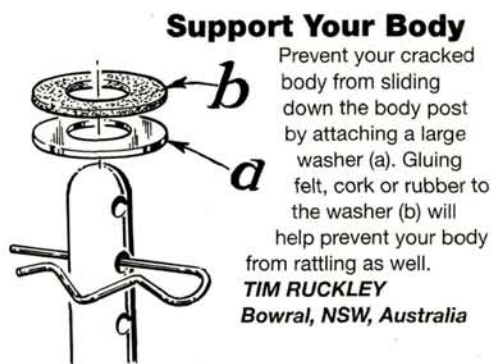
**DAVE COWGER**  
Seattle, WA



### Get a Grip

To get a better grip on your hobby knife when cutting, slip a triangular, soft-plastic gripper onto the end of the knife. It will also help prevent your knife from rolling off the workbench and stabbing you in the foot.

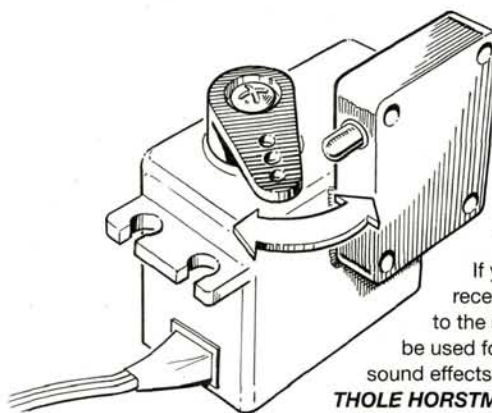
**SEAN JOHNSTON**  
Woodbridge, VA



### Support Your Body

Prevent your cracked body from sliding down the body post by attaching a large washer (a). Gluing felt, cork or rubber to the washer (b) will help prevent your body from rattling as well.

**TIM RUCKLEY**  
Bowral, NSW, Australia



### Turned On

If you use a 3- or 4-channel receiver, glue a microswitch to the side of the third servo to be used for running lights and sound effects.

**THOLE HORSTMANN**  
Uelzen, Germany

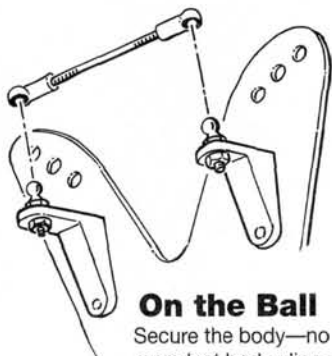
(Continued on page 39)





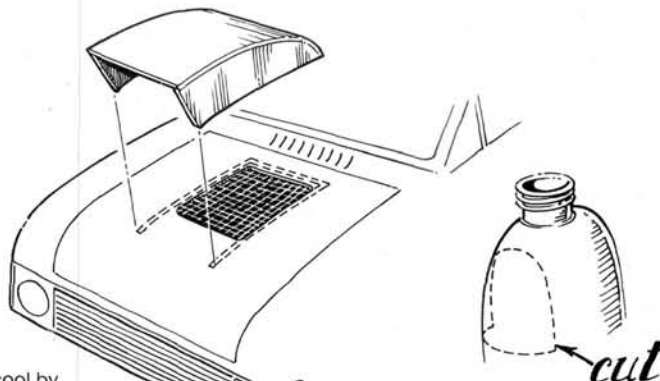
## PIT TIPS

(Continued from page 36)



### On the Ball

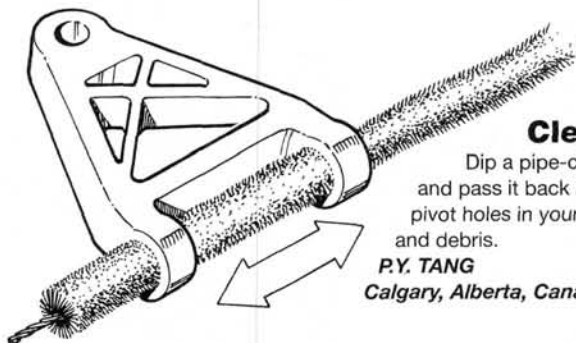
Secure the body—no more lost body clips—on your RC10T and RC10T2 with ball-and-socket joints. Screw the sockets onto a threaded rod, adjust the spacing and snap the paired sockets over the ball joints to stabilize the body.  
**ARNOLD MORALES**  
Kapaa, HI



### Cool It!

Keep your electrics cool by cutting a hood-mounted air intake from a piece of plastic sheeting (or recycled plastic soda bottle) as shown and gluing it to the hood of your car. To keep stones and debris on the outside, glue a piece of window screening under the hood.

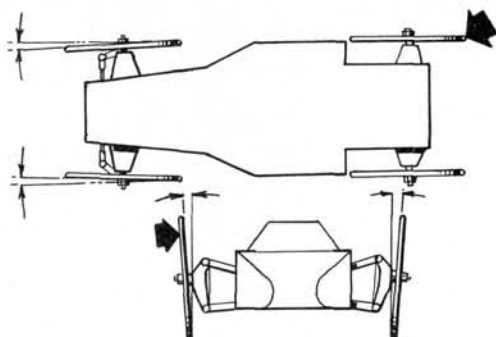
**JORDAN PHILIP**  
Littleton, CO



### Clean-up Service

Dip a pipe-cleaner in rubbing alcohol and pass it back and forth through the pivot holes in your A-arms to clean out dirt and debris.

**P.Y. TANG**  
Calgary, Alberta, Canada



### Play it Again ...

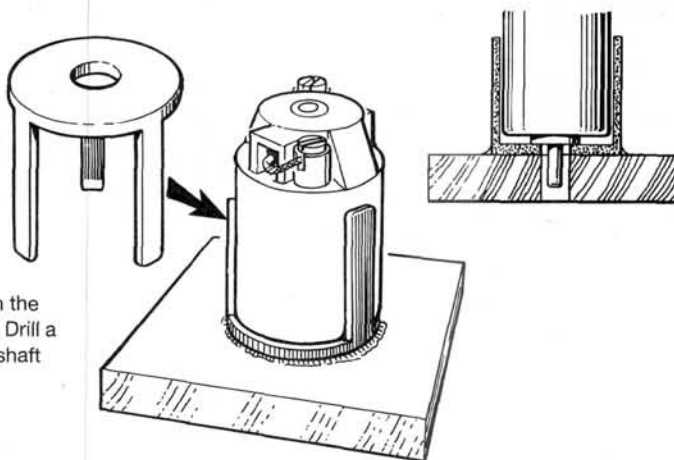
Tune up your wheel alignment by screwing old or worn-out CDs onto each axle. Push the car to measure and adjust toe in/out and caster angle.

**ALBERT SLUSSER**  
Caxias do Sul, Brazil

### Pizza Stand

Craft a workstand for making adjustments to your 540 motor by gluing the small plastic table that rests between the pizza and the box lid to a piece of 1/2-inch (13mm) wood. Drill a hole in the center of the plastic piece and slip the motor shaft into the hole.

**ALEX LAMBERT**  
Camillus, NY



Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o Radio Control Car Action, 100 East Ridge, Ridgely, CT 06877-4606. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.





## Cutting Quality Graphics from Masking Material

**E**VEN IF YOU'VE been in this hobby for only a short time, you've probably painted a couple of Lexan body shells for your car or truck. It's the most popular way for folks to individualize their cars, and lots of hobbyists have two or three bodies that they swap back and forth to create a different look for their R/C vehicles. Unless you're exceptionally creative or artistic, however, you'll most likely wind up with a one- or two-tone color scheme, places on the car that have a little paint bleeding from one color over into the next and a bunch of decals slapped all over the body to hide mistakes. Sound familiar? I'll clue you in on how to get professional-looking results and how to incorporate high-quality graphics into your next paint job!



**This collection of ClickArt Images is inexpensive (under \$30) and contains lots of graphics that look great on R/C vehicles.**

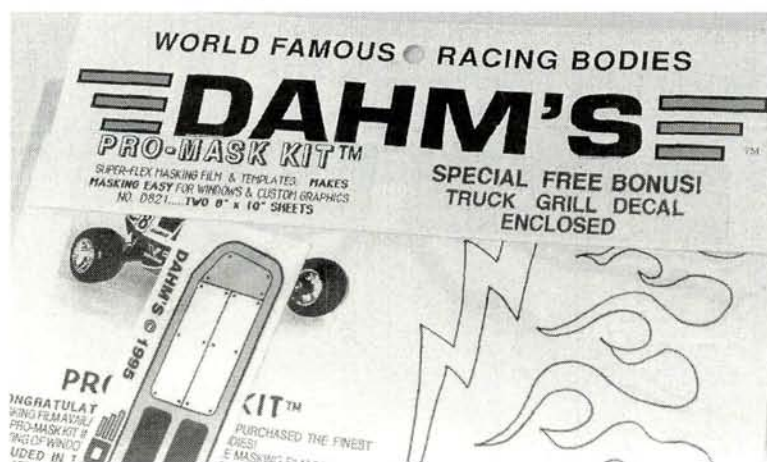
some of his super window-tinting film and a sheet of masking material that was unlike anything I had ever seen.

To begin with, the masking material was thin. And I mean really thin. It was so thin that it easily tracked around corners without stretching or splitting, and it lay down in tight spaces

vinyl. Why was I so excited about paper backing? Because you can print on paper—with a printer!

Around the time I was involved with this project, I bought a present for my technology-proficient 14-year-old daughter: a series of CD-ROMs containing over 25,000 graphic images that she could use for greeting cards, school papers, etc. This particular collection—sold by ClickArt—comes complete with a printed catalogue, a graphic viewer and cut-and-paste software that's fully compatible with Windows 95 applications.

So, here I am, struggling with a graphic design for this car in one room, and my daughter is going nuts over this graphics program in the next room. She calls me over to show me what she's done, and I think, "Shazam!" I could use these images as the basis for the design I'm trying to put together! And then my daughter said, "Too bad you can't just print the graphics right on the page of masking stuff." We looked at each other, then looked at the Dahm's masking material. Wouldn't you know it? The material comes in standard 8½x11-inch sheets that can be fed through most computer printers. I selected some wild-looking graphics from the catalogue, copied and pasted them onto a document template through the PC, and hit the printer button. Voilà! The



**Dahm's masking material is thin and flexible. It comes with a paper backing on which it's easy to print graphics.**

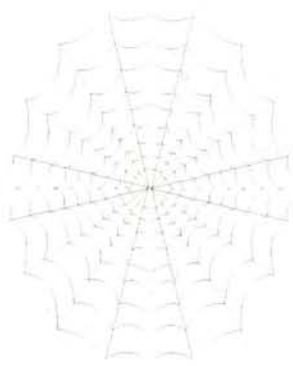
During construction of a project car for *R/C Car Action*, I decided to paint a Dahm's\* Killer Bee body for the article. Because I intended the car to be more of a fun ride than a serious competition weapon, I wanted the paint job to be, well, whimsical. Ira Dahm sent a selection of decals along with the body, as well as

without folding over on itself or wrinkling. These are problem areas when you use thicker, high-quality masking tape, and I've had to redesign more than one paint scheme to work around them. The material was also very

easy to cut. Some masking materials don't take the knife too easily, but when using a new X-Acto blade, the Dahm's masking material cut easily and truly. The masking material was tough, as well. You might think that a material so thin would tear easily, but it's actually pretty hard to rip. It also had a paper backing instead of plastic or



images printed right on the paper backing of the mask, and all I had to do was cut them out and use them on the car body—kind of like a reversed stencil. We use an HP 820cse color printer, but almost any printer that takes plain paper sheets with a feeder should work just fine. I would hesitate to run the masking through a photocopier, however, because the heat generated by those devices would probably mess up the film or the adhesive backing and



You'll have killer line details on your images, just like the pros!

details on the inside with a permanent marker or color pen, and then put a second image on the inside (the program viewer lets you "mirror-image" the graphics) over the line details, and paint it the way you would with any other masking material. You'll have killer line details on your images, just like the pros!

This is an excellent product for anyone who's interested in paint jobs that require more than a

all of the corners properly. (Because of its small tip, a no. 11 X-Acto blade works well.) Because the masking material is so thin, be careful when you cut. Use light pressure!

The good news, however, is that you can also do multiple copies of the graphic image. You can place one image on the outside of the body, draw the line

details on the inside with a permanent marker or color pen, and then put a second image on the inside (the program viewer lets you "mirror-image" the graphics)

over the line details, and paint it the way you would with any other masking material. You'll have killer line details on your images, just like the pros!

This is an excellent product for anyone who's interested in paint jobs that require more than a



**Just cut out the graphic, apply it, and then paint. As a cutting surface, I'm using the glass on an inexpensive framed picture that I bought at a discount store. The masking film is thin, and it clings to compound curves and bumps so well that paint doesn't flow under it when you're painting.**

possibly damage the copier.

Are there drawbacks to using this method? A few, but nothing that can't be overcome. Cutting out individual letters or numbers, for instance, takes a really steady hand. I suggest that you cut them out from the masking side (not the film side). To achieve better results, tape the edges of the masking sheet down on a level cutting surface like a piece of flat glass, and really take your time to get into

single can of spray paint. Because the high-quality masking adhesive prevents the paint colors from bleeding from one area into the next, it ensures razor-sharp lines. It used to be that you had to sweat for hours to get masking tape to lie properly, but with Dahm's masking material, a little ingenuity and a plain-paper computer printer, you should be able to produce professional results in no time!

*\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.*

## NOVAK TEAM SECRETS

### What you should know about ESC OPERATING FREQUENCY

**Operating Frequency, Drive Frequency, or PWM Frequency (whichever name you use) is the most important tool you have to precisely tailor your ESC to your driving style and the track conditions.**

How many times have you gone to a track with a fixed frequency ESC and thought it would be nice to have the power come on sooner, or found a track was slippery and wished the ESC would come on softer? Changing the Drive Frequency gives you the ability to properly match the throttle response to the vehicle and track conditions.

Most ESCs have Drive Frequencies between 2500 and 4200 Hertz. In the past, it was thought that this frequency range was best for the permanent magnet motors we used. Until now! With recent advancements in motor and magnet technology, we have found that all frequencies are usable, depending on what you wish to accomplish.

**Different driving styles require different Drive Frequencies.** If you like your throttle to be punchy, you should use lower Drive Frequencies. For smooth acceleration, you should use higher Drive Frequencies.

**To make your vehicle easier to drive on low traction surfaces, you should use a higher Drive Frequency.** Higher frequencies require more trigger travel to reach the same speed, giving you more vehicle control.

**To make your vehicle easier to drive on higher traction surfaces, use lower Drive Frequencies.** Lower frequencies require less trigger travel to reach the same speed and allow you to make your vehicle accelerate faster.

**Higher Frequency = 5860 to 23400 Hertz  
Lower Frequency = 1900 to 5860 Hertz**

**Just remember there is a Drive Frequency for every driving style and vehicle application.**

The days of fixed frequency ESCs are over! With the **Novak Cyclone Programmable ESC**, you have the freedom of choice to decide what you like. As a stand-alone product (without **Novak's Profile Software** or **Pit Wizard\***) the Cyclone uses the One-Touch button to toggle among three factory-programmed throttle profiles. Changing the profile varies the Drive Frequency, Dead Band, and Minimum Drive.

With Novak's optional ESC Profile Software or Pit Wizard, you can customize nine parameters of the Cyclone, including the individual operating frequencies of Drive, Brake, and Drag Brake\*\*. You decide which operating frequencies to use, from as low as 122 Hz to an unprecedented 23,400 Hz!

**Which frequency should you pick?** To start you off, the ESC Profile Software includes parameter values for **fifteen** sample racing profiles and the Pit Wizard includes **ten**, giving you a launch pad for customization!

**Choose Novak & Choose the Leader in Speed Control Technology!**

*\*Hand-Held Unit-Available June '97. \*\*Patent Pending.*

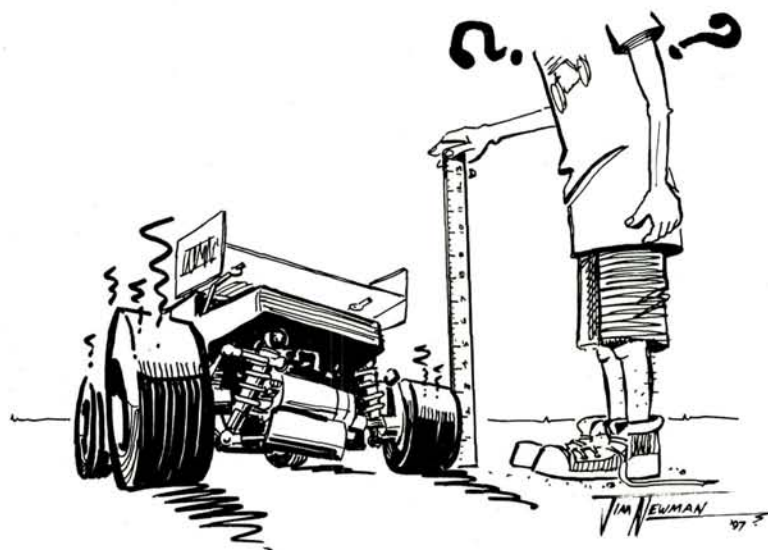
**NOVAK ELECTRONICS, INC. • 18910 Teller Ave.  
Irvine, CA 92612 • (714) 833-8873  
Advertisement**





## TRUBLE SHOOTING

by Doug Mertes



### Rollin' On, Rollin' Out

I've used two formulas to determine gearing, both rollout and overall drive ratio (ODR), but I think there's some conflict between the two. I had a very good run several weeks ago in qualifying, but I had to change tires between heats. I knew I had to adjust my gearing, but when I figured out both rollout and ODR, one seemed to tell me to install a pinion five teeth larger than the one I had used previously! I went with the closest rollout that I could get (1.494 on my fast run vs. 1.518), and the car was as slow as molasses in January! On a whim, for the Main, I put in a larger pinion (three more teeth), and the car went pretty well. What gives? Should I throw both of these formulas out the window? Help!!!

**JERRY HOUTZ**  
McAlisterville, PA

I'd like to find out more about rollout for 1/12-scale on-road racing. I have an Associated 12L; my tires are wearing out, and I'm slowing down! Some fellow racers mentioned rollout to me, but I have no idea how

to figure out a table to guide me. Meanwhile, I'm getting progressively slower! Can you help me?

**JOHN TRIVILINO**  
via email

Ah, the secrets of gearing! Let's face it, guys: how many times have you heard fellow racers trying to decide whether to go up or down a tooth or two after a qualifying heat? Add things like tires or a spur gear that are larger or smaller, and it can get downright confusing. It ain't rocket science, folks, but there is a way to make sense out of all the confusion. Rollout is probably the easiest (and most universal) method to calculate a proper gear ratio, and it's most easily determined with some simple and inexpensive tools: a set of plastic calipers that measure in millimeters (K&S makes great ones that cost under \$5) and a cheap battery-powered calculator. Measure the diameter of the rear tires and multiply that figure by 3.1416. Measure both every time to make sure

they're still the same size, or swap them after each run to ensure even wear; if you're oval racing with staggered tires, use the larger tire for this formula. Divide your result by the number of teeth on the spur gear, and multiply that figure by the number of teeth on the pinion gear. The resulting number is the distance (in millimeters or inches) that the car travels for each rotation of the motor shaft. I suggest that you always work in millimeters because they're smaller and more exact than inches, and you don't have to convert them to decimals. No matter which tire or spur gear changes you make between heats, you can always find out which gear combination you'll need to match the rollout this formula yields. In Jerry's example (he measured in inches), he had an ideal rollout of 1.49; using the same spur gear, he couldn't get any closer than 1.518. Frankly, getting within 0.2 inch isn't all that bad, and I'm not sure that his gearing was the reason his car ran more slowly. It could be that the next battery pack didn't put out as much voltage, the new tires gripped less efficiently, ride height had changed, or the motor was getting tired. The new tires certainly were taller, and this would also add a bunch of rotating weight; that's a killer for any performance ride. As an amusing side issue, by messing around with the algebra (you loved that, didn't you?):

**Diameter x 3.1416 x  
Pinion ÷ Desired rollout  
= Optimum gear**

*If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.*

In this case, the optimum gear would have been a 118 spur and a 22 pinion, yielding a closer 1.482 rollout. Isn't this fun?

Jerry, you also mention ODR, which is a similar formula that uses a motor's rpm as a gearing determinant:

**Rpm x Diameter x Drive  
ratio**

That's great if you really know what rpm your motor turns at. It might work in oval racing some of the time, and I'm sure that if you use it consistently, it will let you know whether you're on the right track, but it's useless for anyone without a dyno, so I'd stick with rollout for now. If you really have a problem with the formulas, calculators and such, try a T.D. Protector Groove Chart. Once you've determined optimum rollout, one of these guides will help to keep you geared properly.

John, you need to ask your fellow racers what rollout they use and give that a try. Once you're comfortable with the speed and run time of your 1/12-scaler, keep the rollout as consistent as you can by juggling spurs and pinions. Remember, however, that optimum gearing is a little different for every motor and many other factors can affect your chassis' speed and handling.

*(Continued on page 46)*





## TROUBLE SHOOTING

(Continued from page 44)

### Change the Fuse, and You Lose

My charger, a Hobbico 900 AC/DC, smokes every time I plug it in. I tried putting different fuses in it, but with a higher-rated fuse, instead of charging, it smokes twice as much! A 30A fuse didn't work; a 4A fuse blew right away, just like the 7A fuse that came with the unit. Which type of fuse do I need to make this thing work? I really need to know because my friends and I intend to go racing, and I don't have anything to charge my batteries with.

Also, how can I get my receiver to work without a receiver pack? I have a Novak M5 sport ESC, and I'd like the receiver to work off the main battery pack. Thanks!

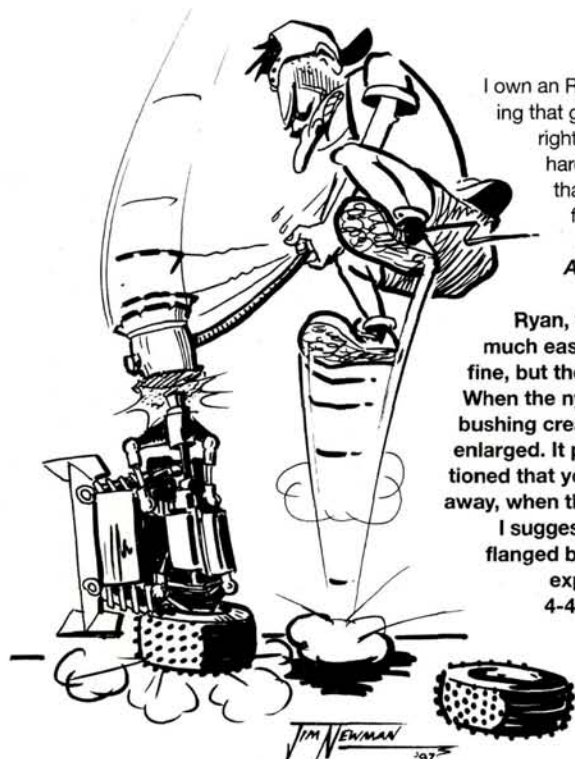
**GARRY HAINES**  
B.C., Canada

Garry, Garry, Garry. The first thing you need to learn is that smoke and electronics just don't mix! Your Hobbico charger comes with a 7A fuse for a good reason: if the circuit that it's tied into tries to pass more than 7 amps for any reason, the fuse blows instead of some more critical and expensive high-end component. Never ever try to upgrade to a higher-rated fuse in a DC circuit; you'll only fry something that will cost you more money. I suggest that you send your charger to Great Planes for repair or buy another charger. This one is smoked!!

Your Novak M5 was designed to power the receiver



and servo without an auxiliary receiver battery pack. Check to see whether the red wire that's part of the connection from the ESC to the receiver is connected to the plug. If it is, just continue to use channel 2 on the receiver and remove the 4-cell pack's power connection. The ESC's power switch will now turn the system on and off. It's unlikely (but possible) that you've damaged your receiver by sending it voltage from both the receiver and the ESC.



### The Wandering Bushing

I own an RC10 Championship Edition that uses bushings instead of ball bearings. The bushing that gets pressed into the rear hub carrier (where the rear wheel axle fits through) on the right side keeps coming out, and it pulls my MIP CVD drive with it. I don't drive my car hard; I modified the suspension and put new on-road wheels and tires on it. I guess that the bushing has just worn out, but why one side and not the other? It's pretty frustrating to have to hammer the bushing back in after every run.

**RYAN HAAS**  
Allentown, PA

Ryan, thanks for enclosing a picture of the bushing and axle assembly; it made it much easier to identify and solve your problem! My guess is that the bushing is just fine, but the socket in the hub carrier where the bushing gets pressed in is too large. When the nylon hub carrier gets hot (like when friction between the axle shaft and bushing creates heat), it can soften to the point at which the socket hole will be enlarged. It pulls out when you turn to the right, and most on-road courses (you mentioned that you had converted the car to on-road) turn right at the end of the straight-away, when the car is moving fastest.

I suggest that you either buy a new hub carrier (they're pretty cheap), install proper flanged bearings that would make it impossible to pull the shaft through (more expensive, but you already popped for CVDs, right?), or drill and tap a no. 4-40 hole through the side of the hub carrier and into the bushing. Use a setscrew to pin the bushing into the hub carrier, and make sure that the screw doesn't protrude into the axle path. If you keep those bushings properly lubricated, however, they'll last a long time!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.



# PRODUCT WATCH

Need to know what's new? What works well and what doesn't? This section is devoted to objective reviews of all R/C car accessory items. From gears and wrenches to motor brushes and shock springs; if you can use it with your R/C vehicle, you'll find it critiqued on these pages.

**50**  
HPI  
2-Speed  
Tranny

**52**  
Trinity  
Zero Friction  
Super Spurs

**55**  
MPH  
Ultra Streak  
Diff Cushions

**55**  
Sanyo  
AA Alkalines

**56**  
Ballistic  
Batteries  
Pro-Trak  
Battery  
Management  
System

**58**  
Davis Diesel  
Conversion  
Kit

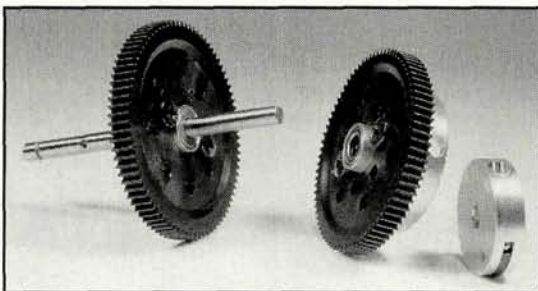
**62**  
IRS  
Axle for  
Formula 1  
Cars

## HPI 2-Speed Tranny SHIFT 'DEM GEARS

**N**EW PRODUCTS and technology are constantly being introduced by the R/C industry. Some improve performance while others increase reliability, but seldom does a product add a whole new dimension to the driving experience. Well, HPI\* recently released a 2-speed tranny that can be bolted right onto the company's RS4 touring car. I can't express how much more fun it is to drive a car that is equipped with a 2-speed tranny.

This new tranny works so well that HPI decided to make versions for all the Associated cars and trucks that use the Stealth transmis-

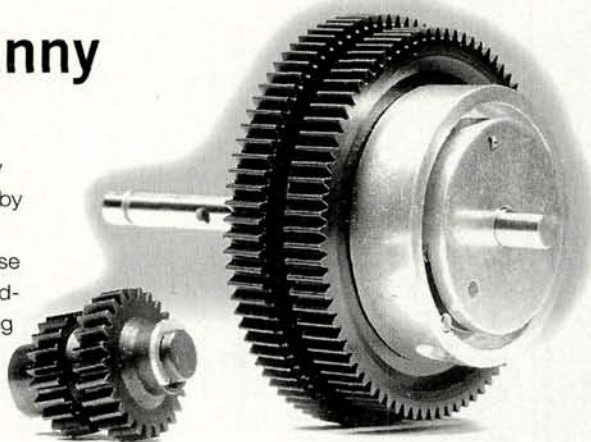
**The 2-speed's best feature is that you can adjust the shift point. . . . Set it tight, and the motor will wind out before it engages the second gear. Set it loose, and the unit will shift almost immediately—great for drag racing.**



**Not too many parts, huh? Fewer parts mean fewer problems. The HPI 2-speed tranny works flawlessly.**

sion. It was only a matter of time before HPI made units for all the Losi Double-X-based vehicles as well. The folks at HPI do not recommend using the 2-speed for off-road racing, however, so use the unit only for street thrashing. The gear cover will not fit over the 2-speed gear cluster, so it's susceptible to damage from dirt.

The 2-speed tranny is extremely easy to build



**The assembled HPI 2-speed tranny—simple to build and install and a kick to drive. Blazing off-the-line acceleration and ballistic top speeds. With a 2-speed tranny, you get the best of both worlds.**

and install; in fact, it's almost idiot-proof. The hardest part of the conversion is disassembling your tranny to install the 2-speed top gear and shaft. The rest of the parts just slide right onto the completed top shaft, and the centrifugal clutch even comes assembled. Two spur gears and two pinion gears are included with every kit, and they're available in different sizes. The unit uses standard spur gears, so finding replacement parts and changing gear ratios is easy.

I installed an HPI 2-speed tranny in my Associated Dual Sport. The car is now quicker off the line and has a much faster top speed, and it's an absolute blast to drive. I also have a unit installed on my HPI RS4, which I've been running for some time now. The 2-speed's best feature is that you can adjust the shift point. It's just a matter of tightening or loosening a setscrew on the centrifugal clutch. Set it tight, and the motor will wind out before it engages the second gear. Set it loose, and the unit will shift almost immediately—great for drag racing. The unit's shift point is completely variable, so you can tailor the shifting to suit any track. Keep in mind, though, that 2-speed trannies are not legal for racing, but if you just want to have some fun, 2-speeds are the way to go.

—George Gonzalez



## TRINITY

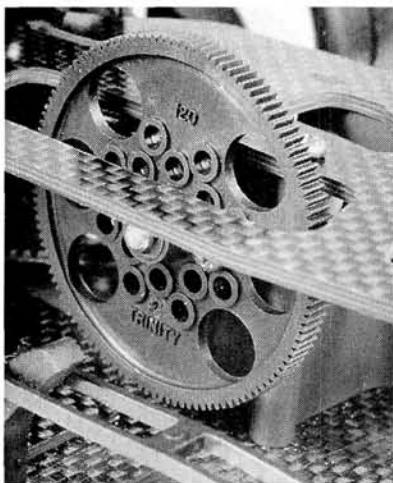
# Zero Friction Super Spurs

MESHING WITH CARBON FIBER

**T**RINITY\* RECENTLY released new spur gears for off-road and on-road racers. The new graphite composite Zero Friction Super Spur gears were designed specifically for Team Losi's Double-X 'CR' and Double-XT 'CR' (48-pitch), while the new on-road gears (64-pitch) fit standard and "Stealth" diffs for numerous on-road and oval cars. The new narrow-profile gears are very light, yet they're also strong and durable. According to Trinity, the graphite composite used to make them ensures stronger teeth that are more resistant to being chipped and worn down under rigorous off-road conditions.

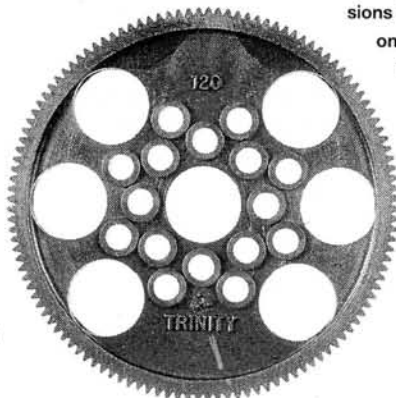
I tested the new spur gears on my Losi truck and my Schumacher S.S.T. (Schumacher produces an optional 64-pitch gear adapter that allows you to replace the standard 48-pitch gears). I mated a Trinity/Team Kinwald Hard Ones 48-pitch pinion

Because of the Trinity gear's hardness, it transfers power from the motor directly to the gearbox as efficiently as possible.



**Above:** with the help of Schumacher's 64-pitch gear adapter, I was able to run one of Trinity's new 64-pitch Zero Friction Spurs on my S.S.T. touring car. **Right:** the new 64-pitch Zero Friction Spurs have the tooth size stamped directly on the gear; they're thin and ultra-rigid.

with the truck spur and a Trinity 64-pitch Zero Gravity pinion with the spur on my S.S.T. Though you can run other pinions with these gears, I recommend you stick with the pinions that these spurs were designed around.



I was impressed with the results. The claim that the gears are very light and strong and run very true is accurate. I ran through quite a few packs with my truck and car and never experienced tooth failure or premature wear. Under normal conditions, these gears should last an awfully long time.

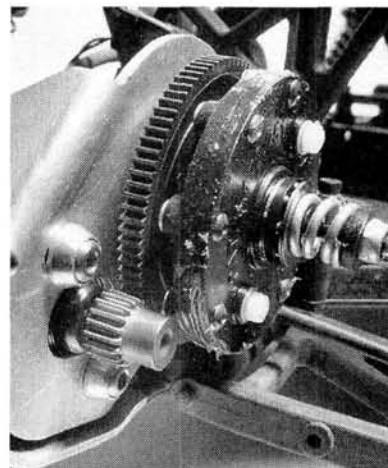
The gears have a slight metallic ring, but I didn't notice that they were any louder than other gears.

Trinity's engineers told me that the gears sound different because they're molded of a harder material that offers an important performance advantage.

Because of the gear's hardness, it transfers power from the motor directly to the gearbox as efficiently as is possible. Softer and wider gears may run more quietly, but at the same time, they absorb more power. Softer spur-gear teeth tend to bend slightly under load, and the gear absorbs energy like a sponge; it isn't as efficient. You won't have this problem with the new Zero Friction Super Spur gears.

The new gears are available in 84- and 87-tooth versions for Losi vehicles, and they're listed at \$3.99. The on-road gears are available in 95-, 100-, 120- and 128-tooth sizes, and they, too, cost \$3.99. So if you're in the market for a new gear for your Losi buggy or truck or your on-road or superspeedway car (or your S.S.T.), I highly recommend that you check out Trinity's new Zero Friction spur gears.

—John Howell



**Top:** Trinity's 48-pitch off-road Zero Friction Super Spurs for Team Losi buggies and trucks come in 84- and 87-tooth sizes. **Above:** the graphite composite gear is easily adapted to Team Losi's Hydra Drive system.

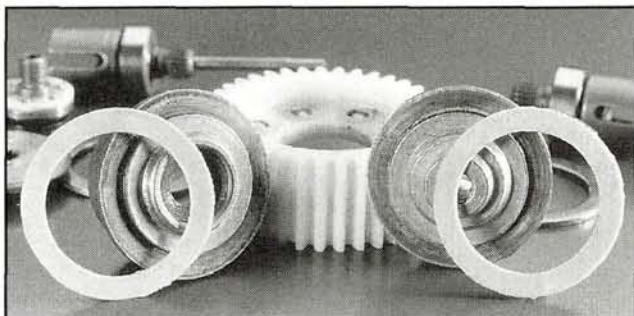


## MPH Ultra-Streak Diff Cushions

SEAL IT AND FORGET IT

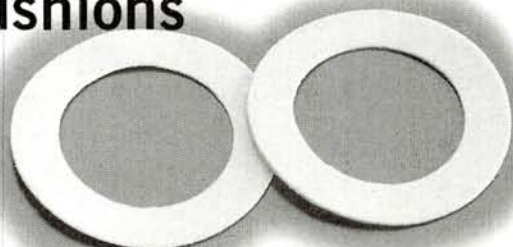
**W**HAT IF I told you that a product that retails for less than \$3 will make your car or truck corner a little better, will improve its off-the-line traction and will allow the ball differential to last twice as long between rebuilds?

Interested? Well, MPH Products\* offers a little item that will do all that and more. Enter the Ultra-Streak differential cushions for Associated, Losi and Tamiya ball diffs.



**The Ultra-Streaks will fit Losi, Associated and Tamiya diffs and can be installed in minutes.**

The Ultra-Streak cushions are the same shape as the diff rings and slightly larger. When you install them between the diff ring and the outdrives (or pressure plates, depending on the type of diff you have), they form a seal that prevents



**Simple and inexpensive, yet effective—MPH Ultra-Streaks.**

dust or dirt from contaminating the diff balls, rings and bearings. Because your diff is now sealed, it will last more than twice as long before you notice signs of wear. And because the rings are actually held in place by the cushions, there's little, if any, diff-ring slip.

Many racers use CA to glue their diff rings to the outdrives because the diff works more smoothly and more consistently when the rings don't slip. Direct-drive on-road racers have used this method for years for the very same reasons.

I installed a set of Ultra-Streak cushions in my Associated Dual Sport's Stealth diff and was amazed at the results. The diff is even smoother than before—something that I thought was impossible. I can't honestly say that the cushions improved my car's performance, but I think that really intuitive racers will notice a difference. One thing I can attest to is that my diff will definitely last longer between rebuilds because it's sealed against the elements.

—George Gonzalez

## SANYO AA Alkalines

LONGER LASTING CELLS

**I**F SOMEONE WERE selling legal sub-C Ni-Cd cells that would produce 30-percent-longer run times, would you buy them? *Duh!* Now, if it's possible to get these same run-time increases in a regular AA dry-cell alkaline, do you think many R/C folks would install them in their transmitters? Yep!

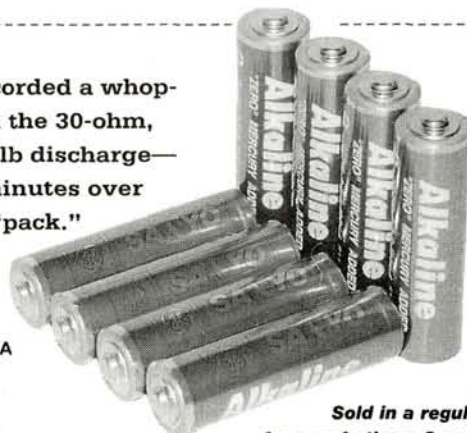
Well, General Electric and Sanyo\* have teamed up and introduced no. 23597 alkaline AA cells, and they do yield a notable increase in useful performance compared with regular brands of AA batteries.

How can I substantiate my claim, you ask? In the April '97 *R/C Car Action*, I did a five-brand AA battery "shootout." The tests included both static- and load-voltage checks as well as a final, killer test that drained each brand of battery down to dead at a very fast rate.

All of the well-known AAs had about the same readings, and after I compared the results

(Continued on page 58.)

**The Sanyo cells recorded a whopping 72 minutes on the 30-ohm, 10W resistor/6V bulb discharge—an increase of 20 minutes over the rest of the AA "pack."**



**Sold in a regular four-pack, these Sanyo alkalines represent a substantial increase in average useful voltage/run time. This means that you can use your car's radio gear longer without fear of control problems.**



# PRODUCT WATCH

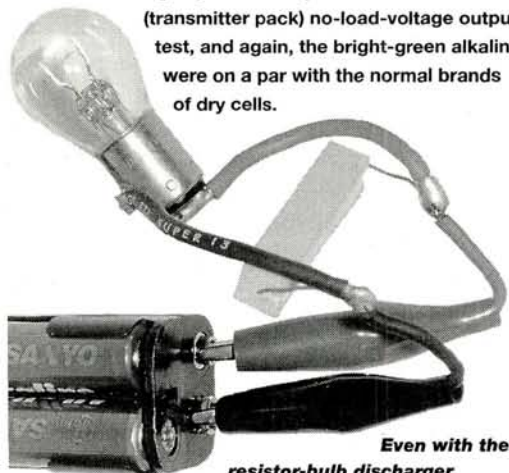
## Sanyo AA Alkalines

(Continued from page 55.)

and cost per battery, the top dog was Duracell.

Now jump ahead three months to when I received the Sanyo AAs via my overworked mailperson. The bright green/gold Sanyos didn't look any more powerful than the other AA brands, but time would tell.

My first check was single-cell voltage straight out of the package. The average for the previously tested alkalines was 1.61 volts, and the Sanyos had a 1.60 reading. My second experiment was an 8-cell (transmitter pack) no-load-voltage output test, and again, the bright-green alkalines were on a par with the normal brands of dry cells.



Even with the resistor-bulb discharger

attached, the Sanyos held up for over an hour before the bulb eventually winked out. The AAs got extremely hot during the test, but they didn't do any damage to the tester!

The real eye-opener, however, came with my final torture test of the Sanyo 8-cell pack. Fifty-two minutes' worth of high-amp discharge time was the high-water mark for the standard alkalines tested in the April article.

The Sanyo cells recorded a whopping 72 minutes on the 30-ohm, 10W resistor/6V bulb discharge—an increase of 20 minutes over the rest of the AA "pack." This test backs up the manufacturer's claim of 30-percent-longer run times than with regular AAs.

The date-coded Sanyos also operate over a wider temperature range than most alkalines, and they're 99.9995 percent mercury-free. Good news for the environment! Of course, with a name like GE/Sanyo, we R/C'ers will expect the best from these batteries—right?

The test results here clearly show these new packs offer a substantial gain in useful voltage (in your transmitter or onboard gas-car receiver pack) compared with regular AA packs. These Sanyos are, without a doubt, the new overall champs in AA dry-cell batteries. If you want more proof, try a set yourself; you won't be disappointed!

—Rick Eyrich

## BALLISTIC BATTERIES

# Pro-Trak Battery Management System

## ONE-STOP CHARGING AND DISCHARGING STATION

IF YOUR involvement in R/C goes beyond the casual level, you probably know that how you *discharge* your batteries is just as important as how you *charge* them. The last few years have seen a proliferation of new cycling, burping, charging and discharge devices, but only a few companies have combined all these functions into a single unit; and none of them allows you to monitor each cell without tearing down the pack. Now the Ballistic Batteries\* Pro-Trak Battery Management System gives racers a tool for all those duties, and more. It's another product of the fertile imagination of England's Phil Haines—the guy whose innovative Intensive Care System active-discharge board was reviewed by George Gonzalez in the March '97 issue of *R/C Car Action*. It's directed not only at the serious guy with primo packs that require delicate handling, but also at the average club racer who wants to get the most out of his batteries.

### FEATURES

Like most high-end chargers, the Pro-Trak requires a 14V to 18V DC power source (or deep-cycle automotive or marine battery) to function. Plug it in, and the first thing that comes up on the unit's backlit screen is a request for your PIN (personal identification number)—just like the ATM at your local bank. This makes the unit worthless to thieves, because without the PIN, it just won't work. Of course, if you lose or forget your PIN, it won't work for you either, so keep this information safely tucked away in your wallet.

Corally connector barrels that mate with the system's lead wires are included; they should be temporarily soldered to the positive and negative ends of the pack. After connecting the battery pack, a series of alligator clips is hooked up to each cell. A diagram of the way the system identifies each cell is included with the instructions, but I just wrote the corresponding cell number on each clip's rubber insulator with a fine-tip Sharpie pen. The clips open wide enough to accept even the big, fat BRP Barz I use on my racing packs, so they should accommodate any battery bar you choose. If any of the clips are attached improperly, the system directs you to that cell with a message on the screen. If you just want to charge, cycle, or discharge the whole pack without monitoring individual cells, you hook up the pack in the same way as any other charger; the individual leads plug into a computer interface socket on the side of the case.

### GETTING CHARGED

To use the system as a charger, select the type of start and charge method: soft start to reduce cell temperature; quick start for a pack



that has been stored for a long time. Patrick Kivin, the owner of Ballistic Batteries, uses the soft start/linear charge mode, alternating charges first with the repulse mode and then with the burp mode to prevent large crystals from forming in the Ni-Cd gel. When connected to the individual cells, the Pro-Trak will give you each cell's capacity, voltage, and internal resistance at the end of the charge, before you hit the track. Cool! At the end of the heat, use Pro-Trak to dump the pack at a 20A rate; if it's connected to the cells individually, you'll also get a readout of each cell's discharge characteristics.

### GET CYCLED

To cycle a pack, follow the directions to scroll through the menu. System parameters allow you to set voltage delta (how much the peak voltage must drop to stop charging), charge amperage, repeak time, repeak amperage, etc., at this time. Half an hour or so later, you'll get the same information as is on most battery-matching labels (yes, you can also print out labels) and much more, including total energy capacity measured in kilojoules. You'll also get a system number called "Power," which is expressed in percentage points and is simply a different way of calculating internal resistance.

**Each time I use the system to cycle these cells, I see modest gains in voltage, pack consistency, and cell capacity. This means faster lap times, especially toward the end of a heat.**

### OTHER FEATURES

The Pro-Trak has so many menu options that it would be impossible to cover them all here, but they include:

- Motor brush break-in that varies voltage to the motor.
- Simulated race discharge.
- Race start, which is similar to the high-amperage bump boxes used by the oval crowd.
- Pack test, which charges the cells at a high amp rate for a very short period to test for bad cells.
- Push charge, which takes 8 minutes to fully prepare a charged and cool pack for the starting line.
- Bump start, for packs that have a history of false peaking.
- TX charge, for when you find yourself minutes from the drivers' stand with low transmitter batteries.
- A port connector for your IBM PC so

that you can store reports and graphs and print labels.

- Graphing software to plot the individual charge and discharge curves of every cell in the pack.

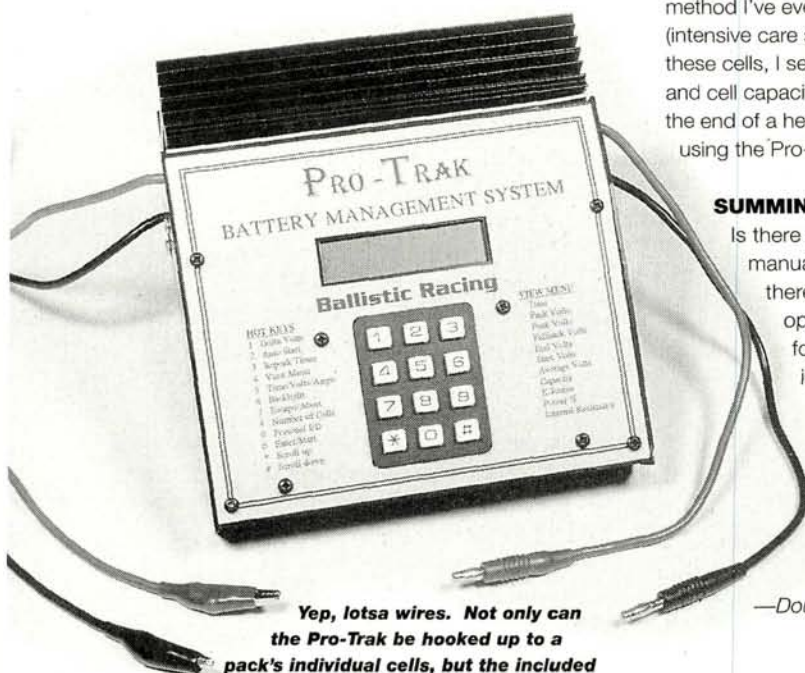
### RESULTS

I tested the Pro-Trak system over several weeks using a half-dozen matched, but well-used, Sanyo 1700 SCRC packs. So far, I'd say that this system does a better job of properly and equally charging and discharging my Ni-Cds than any other method I've ever used, especially when paired with the ICS (intensive care system). Each time I use the system to cycle these cells, I see modest gains in voltage, pack consistency, and cell capacity. This means faster lap times, especially toward the end of a heat. These were good packs before I started using the Pro-Trak, but they're even better now.

### SUMMING IT UP

Is there room for improvement? Sure. The instruction manual needs a lot of help. All the information is there; it's just not clearly presented. The motor test option desperately needs an amp-draw readout for tuners who set their motors up using this critical measurement. (Kivin says that an additional black box to do this is in the works.) Overall, however, this is a solid product that I recommend without reservation. If you're looking for a way to get maximum performance out of all your battery packs, check out Ballistics Pro-Trak Battery Management System.

—Doug Mertes



**Yep, lotsa wires. Not only can the Pro-Trak be hooked up to a pack's individual cells, but the included software and PC connector give you several print options for charge and discharge information. It's a complete battery-maintenance package.**

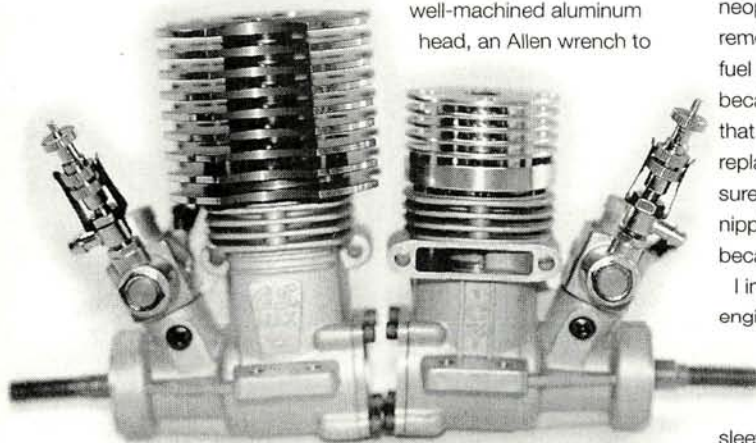


## DAVIS DIESEL Conversion Kit

AN ALTERNATIVE TO GLOW

**Y**OU'RE AT the hobby store scoping out glow fuel. You walk down an aisle past brightly colored fuel containers, and you reach a metal canister that reads, "Diesel Power by Davis." What's diesel fuel doing at a hobby store? You thought only school buses and your grandma's Mercedes used diesel! Nope; now you can turn your glow engine into a diesel-burning powerplant. Why would you want to? Well, Davis Diesel\* claims these advantages: more power, better fuel economy, less engine wear and no more glow plugs and igniters to fuss with.

Davis Diesel offers a diesel conversion head for most .12-size engines, including O.S., Thunder Tiger and Dynamite. When I received the conversion, it came with instructions and included a well-machined aluminum head, an Allen wrench to



**Before and after my O.S. 12 CZ-Z got dieselized. Hey, it looks like I shaved off a little sprung weight in the process!**

adjust the head's timing screw, a diesel fuel line and an O-ring for an Associated RC10GT fuel tank. The diesel fuel (sold separately) is not the same as you buy at the pumps; it's a special blend for model engines. The conversion works on both pull-start and non-pull-start engines that have good compression. As long as it still has good compression, you can also convert an older engine to diesel.

Installing the diesel head is very simple: remove the glow cylinder head, and be sure to transfer the head gasket to

**The Davis Diesel conversion comes with everything you need to convert your glow engine to diesel**

**power. The fuel is not included, but it is available directly from Davis Diesel and participating hobby shops.**



the diesel head. Thin (a few thousandths inch) gasket shims don't work very well here, as they may throw off the compression (timing) of the diesel head.

Next, replace the O-ring on the fuel-tank fill lid with the neoprene one supplied in the Davis kit. It was designed to fit the Associated RC10GT's tank; if you have a different one, take your old O-ring to a hardware store and get a neoprene (black) replacement. If the tank has a primer, remove it and seal the hole. You also have to replace the fuel line with neoprene line (supplied with the Davis kit) because diesel fuel can make regular fuel line swell, and that can restrict fuel flow or allow the line to fall off. I also replaced the pressure line with neoprene line. For the pressure tap on the original RC10GT pipe, I bought a brass nipple and used J.B. Weld\* to secure it in the stock pipe because neoprene line fits the hole loosely.

I installed the Davis Diesel conversion on the O.S. CZ-Z engine in my RC10GT. Of course, I carefully read the instructions and adjusted the needles to the recommended settings: high needle, 2¾ turns out; low, ¼ turn in from the head screw being flush with the sleeve; and the barrel open half the way from a normal position.

Before firing up the engine, advance the throttle-trim setting on your radio to advance the idle needle until the barrel is ¼ open. When the engine has warmed up, you can drop the idle back to normal. After about 1 minute on the starting box, the engine fired. Adjusting the needle valves and timing screw is part of "the diesel process," but I found it complicated and time-consuming, as the adjustments have to be made just right! To set the engine correctly, you must listen for various popping and sputtering sounds. The timing screw on the top of the head raises and lowers the compression. When you've found the right setting, a setscrew

*(Continued on page 62.)*



# PRODUCT WATCH

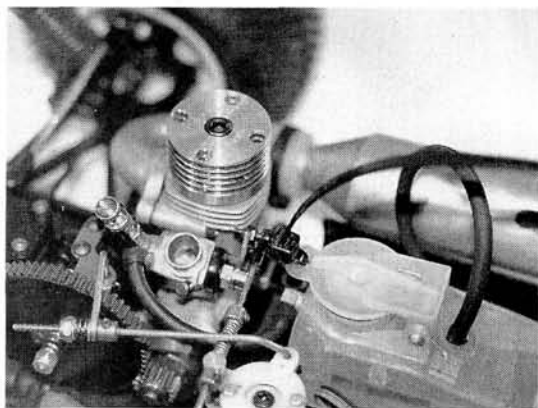
## Davis Diesel Conversion Kit

(Continued from page 60)

on the side of the head holds the compression screw in place.

The recommended setting of  $\frac{1}{2}$  turn out was too much for my old CZ-Z, which worked better at  $\frac{3}{8}$  turn. The low-end needle wound up at the screw head being flush with the sleeve, and the high-end needle was 3 turns out.

A properly adjusted diesel engine will use half as much fuel as a comparable glow engine. It took me around an hour to get it to run properly and accelerate smoothly under load. The diesel should be tested on a straightaway, and remember that changing gear ratios will affect engine



**The dieselized engine is mounted on my RC10GT chassis.**

setup, as will the use of a non-stock tuned pipe.

After getting used to the engine's sounds to tune it and making a lot of adjustments, I am pleased with its performance. It definitely has more power and runs longer on a tank of fuel. At idle, it ran very quietly, and at high rpm, it was loud and produced a lot of smoke. If you're thinking about diesel, take into account that it might be more work than you anticipate, especially if you have a pull-start engine.

The availability of fuel also puts a damper on diesel conversion; only one out of the five hobby shops I went to carries diesel fuel, so you might have to buy it directly from Davis (most hobby shops can get the fuel from their distributor). I also found diesel a little messier to use and it has a nasty smell. But I guess this is the price of more power and better fuel economy!

—Greg Vogel

## IRS Axle for Formula 1 Cars

### A MAJOR IMPROVEMENT FOR YOUR REAR END

**W**HAT IS the heaviest single component on a Tamiya 103RS or Kyosho Impress F1 car? Give up? Once you get past the motor and batteries, the heaviest part on both of these cars is the stock metal axle rod. Although metal axles are tough (I have yet to bend one, and believe me, the way I hit the wall, they'd bend if it were possible), they're also very, very heavy. I like the tough part, but a heavy axle is a bad thing because axle weight is rotating weight. To get the wheels—and the car—up to speed, the motor has to move that heavy axle as well. Although both Kyosho and Tamiya offer upgrade axles that are either graphite or fiberglass, both have disadvantages. The fiberglass axle becomes distorted too easily, and this makes it difficult to remove it from the bearings. And the graphite axle is, well, expensive.

Irrgang Racing Service\* (IRS) has solved this dilemma by introducing a 6mm version of their famous yellow pan-car axle (part no. IRS108 Tamiya F1 fiberglass replacement axle; list price—\$15). Simply replace your metal axle with this one (file a pair of flats for the setscrews in the proper positions for your model), and you'll get the weight advantage of graphite

combined with the toughness of metal. Need more proof? Two F1 Club of Washington members got these as end-of-season points series prizes. Neither of them has managed to break, bend, or distort the axles, and both think their cars have more snappy acceleration, especially in tight turns. I suspect you'd have to fight them to get the axles back!

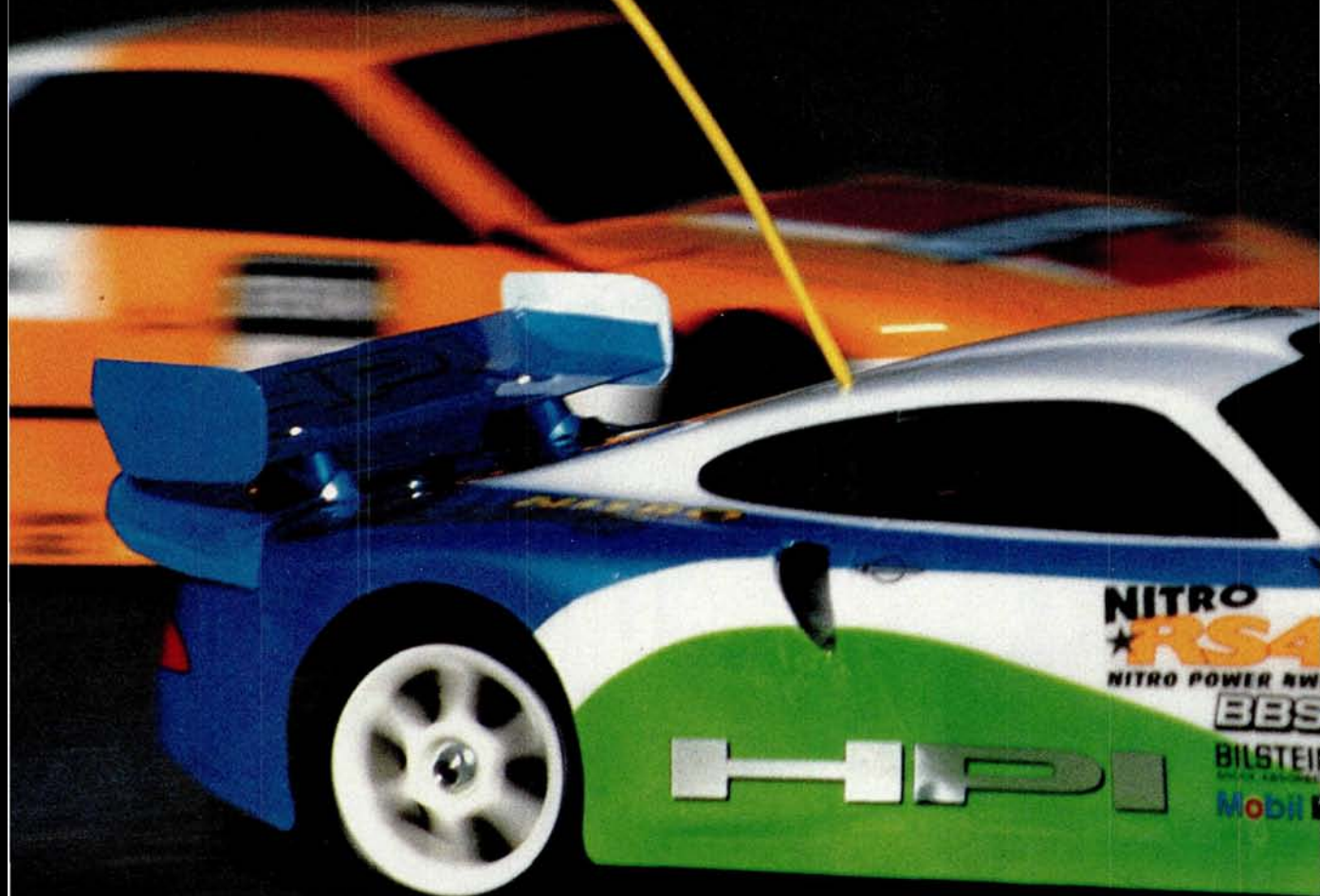
—Doug Mertes

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.



# thrash TEST

1/10 scale gas



## HPI Nitro RS4

**O**NLY A FEW short years ago, Hobby Products International\* (HPI) was a small R/C aftermarket company producing high-performance parts for parking-lot racing kits (Tamiya and others). Their success may be directly attributed to the rapid growth that we've seen in the touring-car segment of our hobby. They make racing tires that actually work, performance-oriented bodies that provide the downforce we need, light and true high-performance wheels and an assortment of driveline and suspension hop-ups that transform our wimpy sedans into 4WD super cars.

HPI has built a reputation on high-quality, high-performance racing equipment.

In '95, HPI shook the R/C world with the release of the RS4 touring car. It was clearly defined as a serious parking-lot racer, and it encouraged the growth in popularity of the high-tech touring-car. Of course, the Yokomo YR4 should get some credit here, too, but it was HPI's aggressive U.S. distribution that made this technology widely available.

Today, HPI is a major player in the R/C industry and continues to initiate trends in parking-lot racing. Take, for

example, the company's new Nitro RS4—a glow-powered touring-car kit. I'll go out on a limb here, folks: nitro touring car racing will become one of the most hotly contested segments of our hobby. And you can rest assured that the HPI Nitro RS4 will play its part.

### KIT FEATURES

The Nitro RS4 is not an electric RS4 that has been converted to accept glow power; it's an entirely new car with many of the same features as the company's new electric tourer, the RS4 Pro (a completely redesigned RS4 that should be available by the time you read this).



# This tourer breathes fire

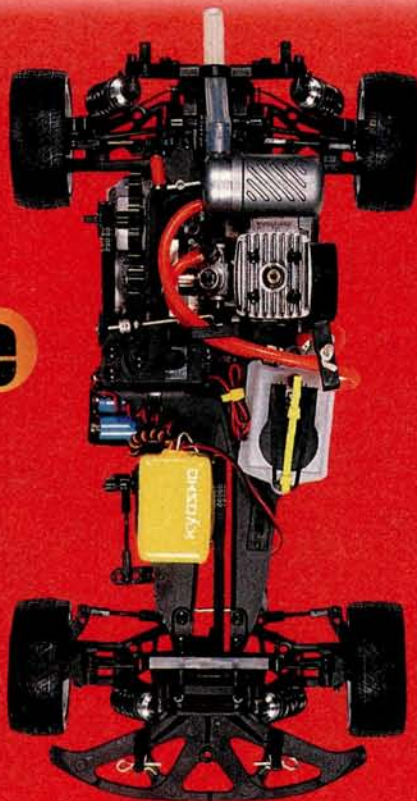
by George M. Gonzalez



• Chassis. At first look, the RS4's new, 2mm-thick aluminum chassis may seem a little thin, but when the bulkheads, engine and upper chassis plate have been installed, it's extremely rigid; to increase rigidity, the sides of the chassis are bent upward. There are holes under the front and rear diffs to allow debris to exit instead of getting trapped inside the gearboxes where it might damage the diff gear and drive belt. If you decide to install a competition engine without a pull-start mechanism, an opening in the chassis will allow you to access the flywheel. My only gripe is that the screw holes aren't countersunk,

so when the going gets rough, the screw heads scrape the track.

The molded upper-chassis plate houses the throttle servo, fuel tank, receiver and batteries. The entire top plate may be removed simply by taking out several screws; then you have plenty of room to work on the engine and drive train. The high-tech people out there might squawk about the molded upper plate, but it does the job it was intended to do: it stiffens the chassis. HPI plans to release a graphite top plate with a 7075, anodized-aluminum chassis, so just be patient.



As you can see from this bird's-eye view, the Nitro RS4's drive train was well-thought-out. Check out how the drive belts travel around the engine via gear shafts and pulleys.

|                       |                                  |                                   |
|-----------------------|----------------------------------|-----------------------------------|
| <b>Specifications</b> | <b>SCALE</b> .....               | 1/10                              |
|                       | <b>LIST PRICE</b> .....          | \$329                             |
|                       | <b>DIMENSIONS</b>                |                                   |
|                       | Length overall .....             | 17 in.                            |
|                       | Wheelbase .....                  | 10 in.                            |
|                       | Width (F/R) .....                | 7.75 in. (193.75 mm)              |
|                       | <b>WEIGHT</b> (gross, RTR) ..... | 3 lb., 4 oz.                      |
|                       | <b>CHASSIS</b>                   |                                   |
|                       | Type .....                       | Flat plate w/upper deck           |
|                       | Material .....                   | Aluminum lower; plastic upper     |
|                       | <b>DRIVE TRAIN</b>               |                                   |
|                       | Type .....                       | Belt-driven 4WD                   |
|                       | Primary .....                    | Clutch bell/spur gear             |
|                       | Transmission .....               | Dogbones/axles                    |
|                       | Differential(s) .....            | Bevel-gear diffs (F/R)            |
|                       | Slipper clutch .....             | None                              |
|                       | Bearings/bushings .....          | Metal bushings                    |
|                       | <b>SUSPENSION (F/R)</b>          |                                   |
|                       | Type .....                       | Lower arm w/adjustable upper link |
|                       | Damping .....                    | Plastic-body, oil-filled shocks   |
|                       | <b>WHEELS (F/R)</b>              |                                   |
|                       | Type .....                       | One-piece plastic                 |
|                       | Dimensions (DxW) .....           | 2x1 in.                           |
|                       | <b>TIRES (F/R)</b> .....         |                                   |
|                       | HPI (standard width)             |                                   |
|                       | M-compound radials               |                                   |
|                       | <b>POWER</b>                     |                                   |
|                       | Engine, pipe, carb .....         | HPI .12 w/pull start and muffler  |

PHOTOS BY WALLER SIDES



## HPI NITRO RS4

I was very pleased to find that the Nitro RS4 has the same awesome steering bellcrank/servo-saver system as the RS4. It's probably the best bellcrank system I've encountered in my more than 12 years of dedication to this hobby. The unit is strong, slop-free and oh-so-smooth. The built-in, spring-loaded servo-saver allows you to adjust the tension or the effectiveness of the system. For a smoother performance, you could even replace the bellcrank bushings with bearings.

• **Drive train.** The Nitro RS4's all-new drive train is very similar to that in the new RS4 Pro electric touring-car kit, but it doesn't have the original 3-gear, sealed, rear gearbox. A single diff gear and drive belt grace the Nitro RS4's rear end. This makes the drive train much more efficient—ultra-smooth power transfer. I kid you not: the Nitro RS4's bushing-equipped drive train feels much smoother than the original RS4's bearing-equipped drive train!

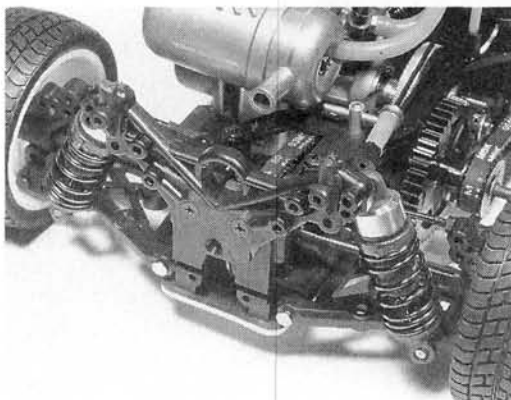
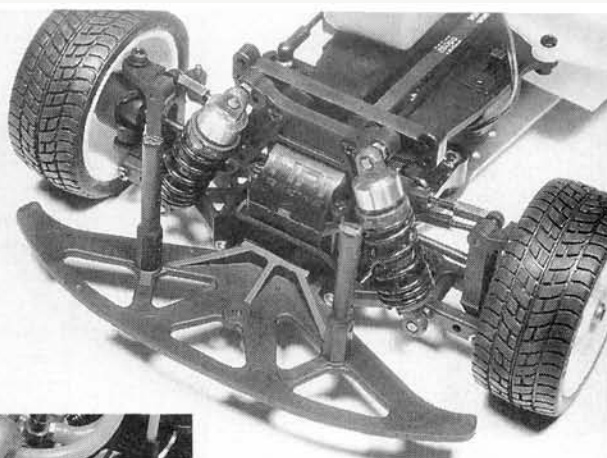
To keep the Nitro RS4 affordable, HPI included front and rear gear diffs instead of the standard ball diffs found on the RS4. The high-quality gear diffs can be adjusted by using grease of a different viscosity. The bushings are made of high-quality steel, and to minimize drag, the bushings that slip over the front and rear outriggers spin on hard metal sleeves.

The drive train has three belts instead of the usual two, and the new belts are slightly thicker to handle the horsepower of the nitro engine. When I built my Nitro RS4, I was a little concerned because the front drive belt seemed to drag on the lower chassis plate. Later, I discovered that the drive belt is lifted right off the chassis when the belt tension is increased during operation.

The material used for the clutch shoes and brake disk—a new fiber composite—is impressive, but might easily be overlooked. (HPI is particularly proud of it.) The molded disk brake provides more linear control when braking, and the 2-shoe clutch is extremely predictable. During my tests, I immediately noticed the car's smooth acceleration and awesome braking. The throttle and brake linkages are well-arranged and easy to adjust. I particularly like the threaded knob on the end of the brake linkage; you adjust the brake strength simply by tightening or loosening the adjustment knob—nice touch.

• **Engine.** The Nitro RS4 kit includes a sweet little .12 powerplant that was designed for first-time nitro racers, so it's extremely easy to tune and maintain, and

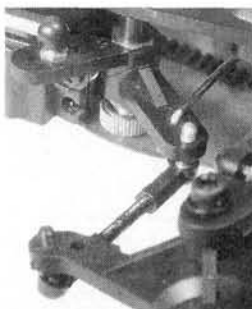
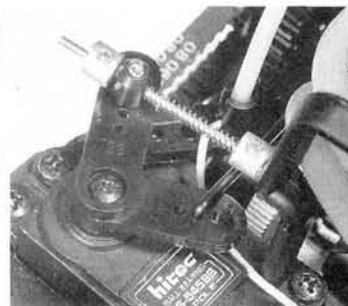
*Right: the Nitro RS4's front end is exactly like that on the new electric RS4 Pro—no more upper wishbones. The camber links make it much easier to adjust camber and access the front diff. The car's new suspension geometry gives it tons of steering, and the plastic shocks are excellent performers. Check out the cool new bumper.*



*Left: the rear end was borrowed from HPI's RS4 Pro electric touring sedan—no more gearbox! Yay! Camber links replace the upper wishbones back here. I really dig the opening in the rear shock tower that allows the muffler tip to exit. The new gear diffs are fantastic.*



*Left and right: Hitec's high-speed/high torque, HS-605BB servo is a strong performer. I also use a Hitec HS-525BB high-speed servo to handle the throttle and brake chores. These units work flawlessly yet cost less than most comparable servos.*



*Left: the RS4's legendary steering bellcrank system has been retained. I guess you can't improve on perfection. Hey! Where are the adjustable tie rods? Right: The HPI Nitro Star .12 is a gem. It took a few tugs to bring the little engine to life, but once we had it going, it was*



*nonstop running from then on.*

### the Competition

|                | HPI Nitro RS4   | Yokomo YR4 GP   | Kyosho Pure Ten 4WD GP |
|----------------|-----------------|-----------------|------------------------|
| Wheelbase      | 10 in.**        | 10.23 in.       | 10.25 in.              |
| Width (F/R)    | 7.75/7.75 in ** | 7.48 in.        | 7.75 in.               |
| Weight         | 3 lb., 4 oz.    | 3 lb., 4.17 oz. | 3 lb., 7.2 oz.         |
| Diff type      | Bevel gear      | Ball            | Bevel gear             |
| Brakes         | Disk            | Fiberglass disk | Disk                   |
| Exhaust        | Expansion       | Expansion       | Expansion              |
| Price          | \$329           | \$400           | \$349.99               |
| Available at*  | \$219           | NA              | \$219.99               |
| Issue reviewed | 6/97            | —               | 7/96                   |

\*Prices may vary with location. \*\*Adjustable width



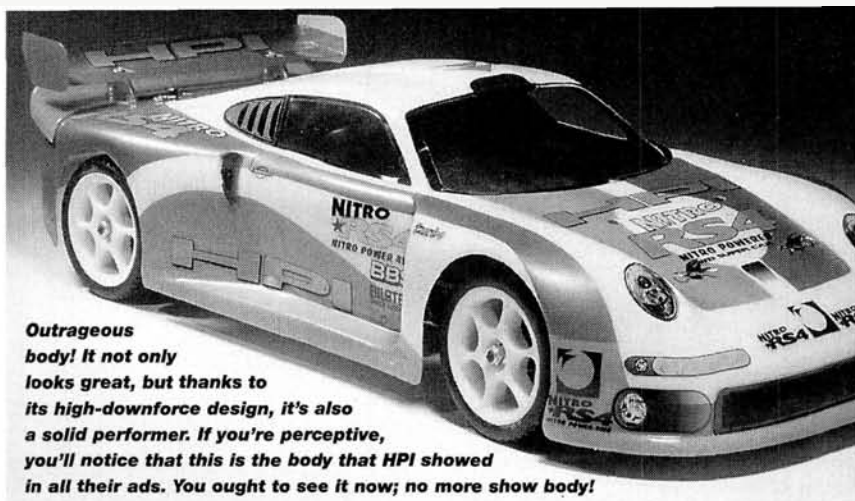
## HPI NITRO RS4

a tuned muffler (not to be confused with a tuned pipe) keeps the noise level down. To make life even easier, HPI omitted the bottom-end throttle adjustment on the carburetor. Of course, there's a pull-start mechanism, so you don't have to lug starting equipment around. A 75cc nylon fuel tank is positioned left of center on the chassis—a location that makes it easy to access even when the body is mounted. The tank features a priming button and a quick-fill cap.

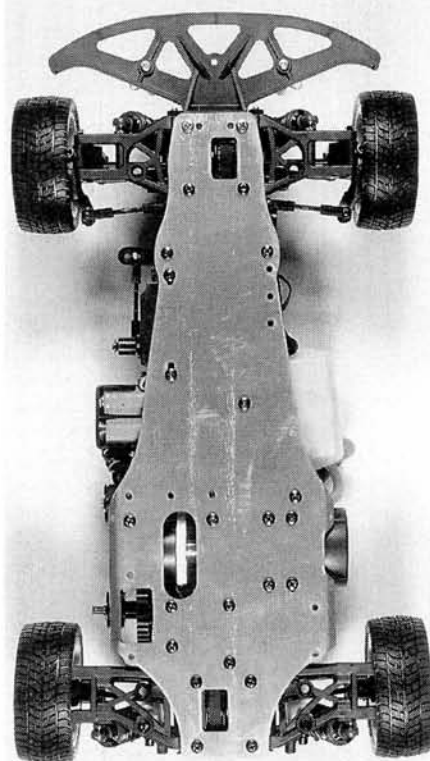
• **Suspension.** Here's where the big changes were made. The Nitro RS4 has the same suspension as the company's RS4 Pro; the front end has been redesigned to provide more steering and to facilitate tuning. Right away, you'll notice that the RS4's original wishbone upper arms have been replaced by more conventional threaded camber links. This not only makes camber adjustment much easier, but it also makes accessing the front diff less of a hassle. The original RS4 was a pain to work on, but the Nitro RS4 is user-friendly. I have to admit that I was a little disappointed that HPI did not include turnbuckle tie rods. The included threaded rods do allow you to adjust camber, but to lengthen or shorten the rods, you have to remove them from the car.

The Nitro RS4's suspension arms are very similar to those on the original RS4. You have the option of building the car wide (200mm) or narrow (180mm). The big difference, however, is that even if you decide to build the car wide, you can still use HPI's optional swaybars for narrow cars. Just for the record, I highly recommend that you build the car wide; it handles much better that way, and there are tons of wide bodies available from HPI and other R/C body manufacturers.

To stay within the "affordable" guidelines, all corners have plastic-body shocks with steel shock shafts. The shocks feature



**Outrageous body! It not only looks great, but thanks to its high-downforce design, it's also a solid performer. If you're perceptive, you'll notice that this is the body that HPI showed in all their ads. You ought to see it now; no more show body!**



**Left: this underbelly shot shows one of the kit's few flaws. The screws are not countersunk. They're sure to get all scratched up when the ponies are introduced to the ground. HPI made an opening for flywheel access, and openings under the diffs allow dirt and small pieces of debris to exit instead of getting trapped inside the gearboxes where they could do considerable damage.**

### Likes

- Excellent drive train and suspension
- Incredible handling.
- High-quality materials throughout.
- Fast, reliable engine included.
- Great-looking wheels and tires.
- Fantastic hop-up potential.
- Build wide or narrow—your choice.
- Killer-looking body.
- Excellent instructions.
- Excellent factory support.
- All the electric RS4's best features have been retained, and the Nitro will accept most of its hop-ups.

### Dislikes

- Not too crazy about those threaded camber rods.
- Should have included several choices of shock piston for more tuning options.
- Stainless-steel shock shafts would have been nice.
- Stock springs are too stiff.
- Shock fluid smells awful and is of very low quality.



## Building & Setup Tips

The Nitro RS4's instruction manual is very well-done. If you don't like to read wordy instruction manuals, you'll love building the Nitro RS4. You'll find CAD drawings for every step, full-size hardware-identification sheets and very little text. Before you start building, become familiar with all the kit's major components, and give the instructions a once-over—twice!

• **Page 3** shows a handy full-size parts reference that I suggest you photocopy because you'll want to refer back to it whenever you encounter a new step. It's much easier to have the page there in front of you. I guess you could tear the page out of the manual, but if you do, you might lose it.

• **Step 1.** Most of the molded parts come on trees. You'll need a sharp hobby knife or side-cutters to cut these parts off because the plastic is very hard. Pay particular attention to the tree-mounted shock pistons (Step 1); the shocks will never work smoothly if the pistons have burrs; file them off with a fingernail file.

• To minimize "stiction," coat the shock's O-rings with RCPS® Green Slime. And avoid over-tightening the aluminum shock caps, or they'll be a pain to remove later.

• **Step 2.** Use plenty of grease in the front and rear gear diffs. I used the

entire tube supplied.

• **Step 3.** The rear-diff outdrive bushings slip inside molded bulkhead belt-tension adjusters that have small numbered notches that mate with corresponding holes inside each bulkhead. For proper rear-belt tension, the manual recommends that you install the belt-tension adjusters in bulkhead hole no. 4, and I found this to be dead-on; you can vary the tension by installing the adjusters in different bulkhead holes. Be sure that the outdrive bushings are installed in the same hole on both bulkheads.

• **Step 6.** You can set up the car to be wide or narrow. It will handle much better if built wide.

• **Step 8.** Be sure to remove the small tab on the suspension-arm mount as directed in the instructions. If you don't, the belt will rub against it.

• Grease all the steel bushings properly before you install them in the car. I used Paragon® Liquid Bearings; the stuff really works.

• **Step 11.** Although the instructions don't say so, it's extremely important to put liquid thread-lock on the Z543 screws that secure the engine to the aluminum engine mounts. In addition, put thread-lock on the Z517 screw that holds the clutch bell on the crank shaft and on the Z517 screws that



## FACTORY OPTIONS

- Ball-bearing kit—part no. B041.
- Pro shocks (hard-anodized, set of two)—part no. A111.
- Universal dogbones (narrow, silver)—A510 (front), A511 (rear).
- Universal dogbones (wide, black)—A513 (front), A514 (rear).
- Nitro Star .15 engine w/pull-start—1605.
- Nitro Star .15SS (Pro engine w/pull start)—1600.
- Nitro Star .15SS (Pro engine w/slide carb; no pull-start)—1610.
- Swaybar sets (six bars)—A209.

### Coming Soon

- Anodized-aluminum (7075) countersunk chassis.
- Tuned pipe.
- Graphite upper deck.
- 2-speed tranny.
- Ball diffs.
- and much, much more ...

two-piece aluminum caps, double O-ring seals and really trick rubber bladders that prevent the shock oil from foaming. The kit includes only one set of two-hole shock pistons and some funky-smelling petroleum-based shock fluid. I found the shocks quite smooth, but I still recommend that you pick up HPI's optional Teflon™-coated shock-piston kit (part no. 6818) and their stainless-steel shock shafts (no. 6807). With these items installed, the stock plastic shocks will work just as smoothly as HPI's optional, hard-anodized aluminum shocks.

While you're at it, you might want to pick up some softer springs and some pure silicone shock fluid in a variety of weights. The stock springs make the car feel a little too stiff—OK for high-bite tracks, but on slippery surfaces, the car will slide all over the place. HPI offers some really cool color-coded tuned springs in various rates.

• **Odds and ends.** I received one of the first Nitro RS4 kits to leave the factory. My car came decked out with one of HPI's



**Yup, these cool 6-spoke wheels and HPI radials are standard issue. These tires work great on high-bite surfaces.**

new 911 GT1 bodies; in fact, I received the actual model that HPI used for all the photography—including the picture on the kit box. Wow! What an honor! The G-man actually gets to destroy this famous body! Currently, HPI offers the Nitro RS4 with three body-shell options: an NSX (no. 401), a Viper Le Mans (no. 402) and the 911 GT1 body shown here (no. 400). If you'd like to provide your own body, they even sell the kit without one (no. 420), and any currently available 190 to 200mm body will fit.

My kit included a set of HPI's new 6-spoke wheels (white) and a set of HPI radials molded out of the company's hard, "M"-compound rubber. These tires work best on high-bite surfaces; when things get slippery, you'll want to install softer rubber.

### TEST GEAR

- Futaba\* Magnum 3PDF FM transmitter and R113F FM receiver.
- Hitec\* HS-605BB high-speed/high-torque steering servo.
- Hitec HS-525BB high-speed throttle servo.
- Blue Thunder\* 20-percent-nitro glow fuel.
- OFNA\* alkaline glow igniter.
- Du-Bro\* fuel-line filter.
- DuraTrax\* fuel line and fuel bottle.
- Kyosho\* receiver cover.

### PERFORMANCE

The "Thrash" portion of this test was at a roller-hockey field near our Connecticut office—a freshly paved surface that was a little more dusty than I would have liked. I asked executive editor Frank Masi to come along because he really knows glow power.

At first, I had trouble getting the little .12 started. I checked the fuel-mixture setting: locked at 3 turns open; I checked the idle setscrew: the carb opening was exactly 1.5mm; I checked the fuel lines: fuel was flowing. Then Frank asked, "Did you check the glow plug?"

I installed a new glow plug, yanked on the pull-starter, and the engine fired right up. After running four or five tanks of fuel through the engine, Frank leaned the engine out one click at a time while I took some hot laps. After every 2 or 3 minutes of running, I pulled the car in so Frank could monitor engine temperature. After a couple more tanks of fuel, Frank gave the all-systems-go signal, and I put the pedal to the metal.

Considering that the suspension felt a little stiff and the supplied tires are a little on the hard side, I was amazed at how well the car ran. It handled the less than perfect surface quite nicely. Occasionally, going around sharp corners, it would start to hook, but a little throttle correction got it back in shape. The Nitro RS4's speed is brisk, but very easy to tame. Top speed is probably in the neighborhood of 20mph (about the same as the electric RS4 with a competition stock motor). This isn't exactly ballistic, but if you have a need for speed, you could install a tuned pipe, a carb with a larger bore and a tall heat-sink head. For even more speed, think about getting an HPI Nitro Star 15 or an O.S.\* .12 CZ-Z or CV engine. Overall, I was happy with the car's speed and think that by keeping the engine's ponies under control, HPI is on the right track.

(Continued on page 196.)

keep the engine mounts on the chassis. And don't forget to grease the needle bearing inside the clutch bell.

This isn't in the instructions, but you can alter the tuned muffler's performance. You'll notice that the baffle (part no. A876) has a central hole and two partially drilled holes on either side. For the most modest performance and the quietest operation, run the pipe in the stock position (one hole open); open another hole, and performance will be increased somewhat, but the engine will be slightly louder; open the third hole and the car will be even faster and much louder. Finally, remove the baffle altogether, and the pipe will offer max performance, but will be sinfully loud, too!

• **Step 14.** To protect your receiver from fuel spills, enclose it in something, e.g., a balloon. I use a Kyosho Receiver Cover; mounted on the chassis, it protects the receiver from moisture and looks cool.

• Follow the engine break-in procedure given on page 17. First set the idle

### THINGS YOU'LL NEED

- 2-channel radio system with two servos.
- 12 "AA" batteries.
- Fuel and fuel bottle.
- Glow igniter.
- Paint for the Lexan body.
- CA for the tires.
- Liquid thread-lock.
- After-run oil (highly recommended).

stop screw: the included 1.5mm Allen wrench is the right diameter for setting the idle stop. Turn the screw clockwise to increase idle speed and counterclockwise to decrease idle speed. Adjust the carb opening (venturi) until it is of the same diameter as the Allen-wrench tip. Next, open the needle valve 3 full turns. You are now ready to break in the engine.

• When you have run three or four tanks of fuel through the engine, you can start to lean it out for performance. You may also have to readjust the idle stop screw once again. Just be sure to lean the engine out only 1 or 2 clicks at a time, and constantly monitor its temperature. Keep in mind that the HPI .12 runs a little hotter than most sport engines.

As time goes on and I become a little more familiar with the car, I will pass along some setup tips. Meanwhile, if you build the Nitro RS4 according to the instructions, you should end up with a pretty dialed car.

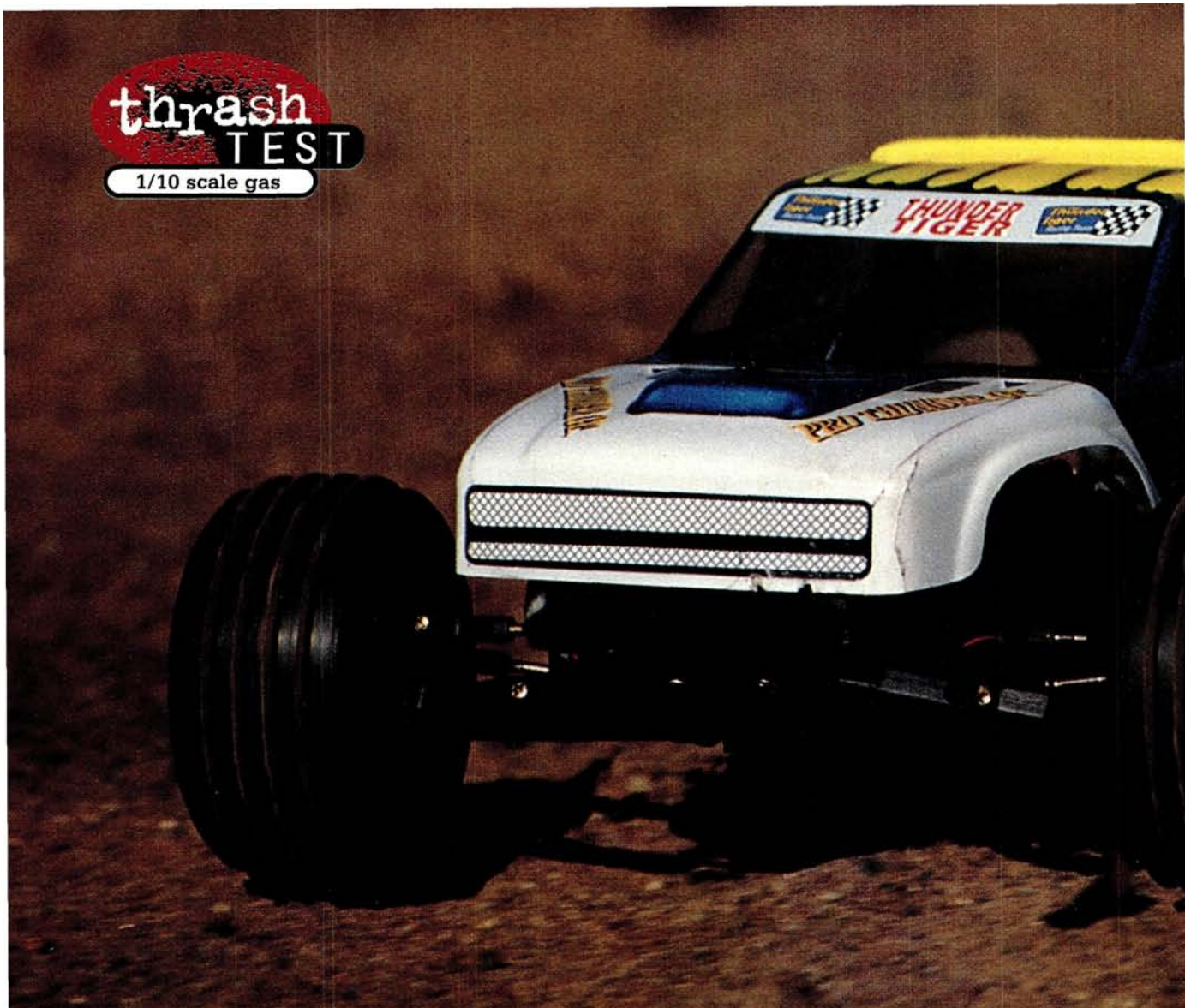






**thrash**  
**TEST**

1/10 scale gas



## THUNDER TIGER **Pro Thunder GT**

by Peter Vieira

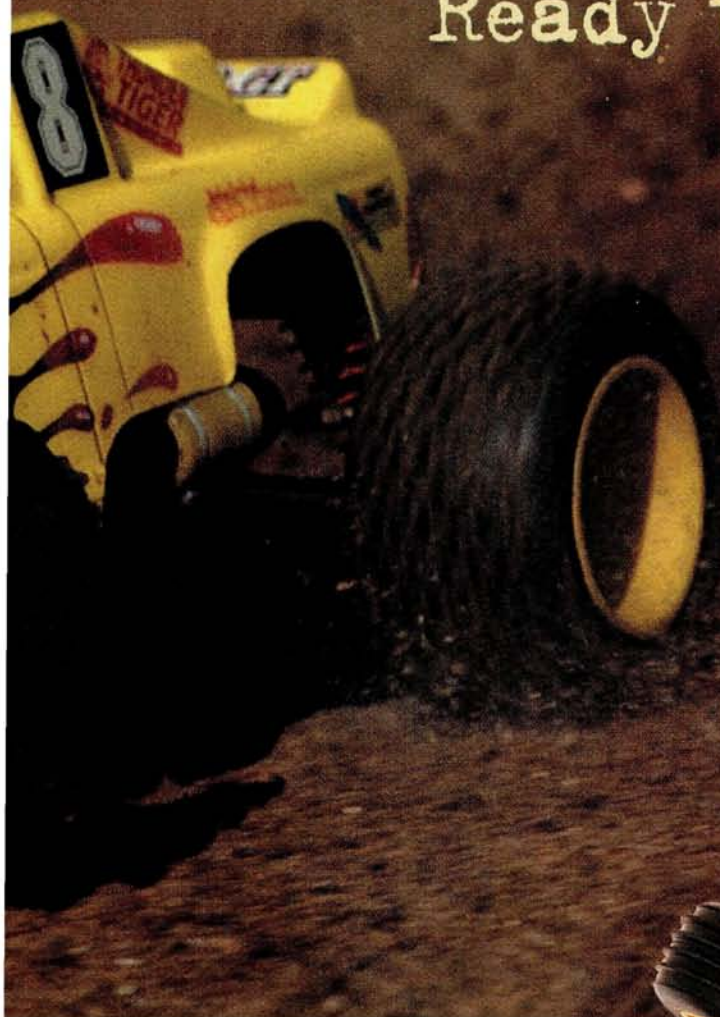
**M**AYBE THEY'VE got a new incentive package. Maybe they have some fired-up managers to motivate them. Maybe they're chained to the drafting tables and can't go home until something cool appears on the boards. Whatever the reason, the crew at Thunder Tiger\* has been churning out some exciting kits lately. Associate editor George Gonzalez raved over the Challenger Pro buggy back in the May issue, and A.R. Flatbush dug the Mirage Pro back in October. Now I get a taste of the Tiger with their new Pro Thunder nitro truck, and if first impressions count for anything, this should be one heck of a truck!

### KIT FEATURES

Blue everywhere. That was my first thought as I pulled the Pro Thunder out of its shipping carton. The chassis, radio tray and shock towers all have a bright blue-anodized finish that goes well with the black plastic of the car's other components. Once I got past all the glitz, thought number two was, "Hey, this thing's built!" I received a preproduction kit that was 100 percent assembled, but production versions will be 90 percent off the bench. I didn't get instructions with my completed kit to explain the 10 percent that Thunder Tiger doesn't do for you, but you can probably expect to paint the body, install throttle/brake linkages and mount tires before you tear up your local track. Both George and A.R. can attest to Thunder Tiger's thoroughness in the instructions department, so production Pro Thunders should be well-supported with rebuild info and operating tips. Of course, there's a lot more to this truck than being blue and built, so let's move in for a closer look ....



# Ready to run racer



PHOTOS BY JOHN HOWELL AND WALTER SIDAS

• **Engine.** The star of any gas car is the engine, and the Pro Thunder is no exception. The Pro-12BZX thumper has the look of a potent powerplant, and its looks aren't just skin deep; a ball-bearing-supported one-piece crank, true chrome sleeve and oversize heat-sink head attest to its power potential. Firing up the Pro-12 should be a breeze, thanks to the robust pull-starter sprouting from the crankcase. A rotary carburetor, paper-element air filter, two-shoe clutch and bolt-on manifold round out the power package. A nicely shaped tuned pipe is included—and it's plastic! I've dented some pricey pipes in my day, so I like the plastic pipe idea.

• **Transmission.** Channeling the "go" power to the rear wheels is a compact three-gear transmission with plenty of features. The spur gear is mounted on an adjustable slipper clutch so full-throttle launches and wide-open landings won't



*From the top, the cleanliness of the Pro Thunder's layout is apparent. A little servo tape on the radio tray will prevent the battery box from being squirted out from under the zip-tie.*

## specifications

**SCALE** ..... 1/10  
**LIST PRICE** ..... \$458.99

**DIMENSIONS**  
Length overall ..... 15.25 in.  
Wheelbase ..... 10.6 in.  
Width (F/R) ..... 11.75 in.

**WEIGHT** (gross, RTR) ..... 4 lb., 6 oz.

**CHASSIS**  
Type ..... Semi-tub with upper deck  
Material ..... Stamped aluminum

**DRIVE TRAIN**  
Type ..... Sealed gear  
Primary ..... Pinion/spur  
Transmission ..... Universal joint drive shafts  
Differential(s) ..... Adjustable ball type  
Slipper clutch ..... Adjustable friction  
Bearings/bushings ..... Shielded transmission bearings/bronze hub bushings

**SUSPENSION (F/R)**  
Type ..... Independent A-arm with turnbuckle camber link  
Damping ..... Oil-filled, aluminum-body coil-over shocks

**WHEELS (F/R)**  
Type ..... One-piece plastic  
Dimensions (DxW) ..... 2.2x2 in.

**TIRES**  
Front ..... Firm rubber 4-rib semipneumatic  
Rear ..... Firm rubber 7-row mini-pin

**POWER**  
Engine ..... Thunder Tiger Pro-12BZX 2-stroke  
Pipe ..... Plastic tuned pipe  
Carburetor ..... Rotary barrel



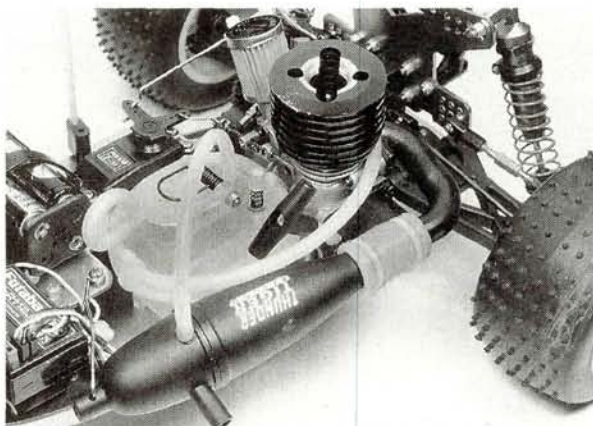
## THUNDER TIGER PRO THUNDER GT

overtax the drive train. Each gear is supported by ball bearings, and the differential is a smoothly turning ball unit. Unfortunately, it cannot be adjusted without removing the drive axles, but it does hold its setting once it has been dialed in. As delivered, my kit's tranny felt a bit "notchy"; when I opened it to investigate, I discovered that the top gear and idler gear are metal! That's a durability-enhancing upgrade that would cost extra on other trucks. As for the "notchiness," I fully expect it to disappear after a little break-in time; it's just a temporary downside of the metal gears. The transmission sends power to the rear wheels through a pair of well-made universal-joint drive shafts. To stop those wheels, a rod-actuated brake puts the squeeze on a fiberglass disk that is keyed to the spur gear. The assembly is bolted to the transmission case, much like Associated's RC10GT brake system.

• **Chassis.** At this point, I was ready to see Thunder Tiger do some heavy-duty skimping on the chassis to cover the cost of the primo drive train. Wrong! There's plenty more good stuff. The aluminum main chassis plate features aggressively radiused sides that form a low-profile tub, and a wide radio tray adds stiffness to the truck's front end. In the rear, a turnbuckle brace connects the transmission to the radio tray and ties all the components together for a solid-feeling chassis. It's a slick-feeling chassis, too; all the screws that pass through the underside are countersunk—a

nice touch often missing from gas vehicles. The chassis is narrow, but a logical layout prevents things from getting too crowded, even with two full-size servos, a chunky receiver and the kit's 75cc fuel tank. A somewhat uninspired-looking body protects the mechanicals and is mounted on two body posts that sprout from the rear shock tower; a single post holds up the nose.

• **Suspension.** I plan to show this truck enough air time to qualify for a story in *Model Airplane News*, so a rugged suspension system is a must. With large-diameter, anodized-aluminum oil dampers at all four corners, the Pro Thunder looks capable.



**Power central:** the 12BZX engine is fed by a 75cc tank with a built-in primer button.

Adjustable shock collars make spring preload adjustments a snap, although I'm wary of the super-soft springs included; they feel like refugees from an impossibly



**The Pro Thunder's suspension components favor strength over svelteness. Check out the w-i-d-e flats on the turnbuckles. No wrench slip here!**

huge ballpoint pen. The shocks are actuated by long front and rear A-arms that strike a good compromise between durability and performance; for extra resiliency, the plastic used is a little soft but the arms are thick so they won't flex when the going gets rough. And believe me, it will get rough when it's time for the "Thrash" part of the test! Thanks to turnbuckle upper links and a wide selection of mounting-hole options for the links and shock ends, the Pro Thunder's suspension geometry is fully adjustable. The only weak points I can see are the truck's blue aluminum shock towers; they're pretty all right, but a few good smacks on the lid might fold them. We'll see.

• **Wheels and tires.** Thunder Tiger made some good choices in "specing" the Pro Thunder's seven-row mini-pin rear and four-rib front tires. Both pairs are molded of a firm rubber compound that will tolerate pavement running without shedding their treads or ballooning like top-fuel-dragster tires. Is it race-ready rubber? 'Fraid not, but who's racing? I'd rather

## Check your Range!

**A** range check is a good idea for any model, but especially for gas cars and trucks. Unlike an ESC-equipped electric vehicle, which will stop or just act "confused" when out of range, gas cars tend to take off—usually wide open—and head for the nearest immobile hard object. Wrecking your car is a bummer, but worse things can happen; you could hurt someone or damage their property. Here's how to check your range.

**THE WRONG WAY.** Do not test radio range by driving the car away from you until you lose control! Yes, you will find the extent of your range, but you will also have to find out how fast you can run. Then you'll find out that you can't run fast enough. The rest you won't want to find out.

**THE RIGHT WAY.** Instead of moving the car away from you, move yourself away from the car. Put the car on a block or stand so all four wheels are off the ground, and back away while you work the throttle and steering. Keep going until you lose range or run out of room to back up. If you don't have or can't find a suitable stand, at least have the car pointed toward you while you back away. If it decides to run away, the car will take off *into* range instead of *out* of range. If you discover that you have very little range, solve the problem; don't drive around it. Usually, it's a simple case of installing fresh batteries or new crystals, or improving the receiver antenna routing.

| the Competition             | Traxxas Nitro Rustler | Thunder Tiger Pro Thunder Stadium Truck |
|-----------------------------|-----------------------|-----------------------------------------|
| Wheelbase                   | 11.83 in.             | 15.25 in.                               |
| Width (F/R)                 | 12.5/12.375 in.       | 11.75 in.                               |
| Weight                      | 3 lb., 9.68 oz.       | 4 lb., 6 oz.                            |
| Diff type                   | Planetary gear        | Adjustable ball type                    |
| Chassis                     | Aluminum              | Stamped aluminum                        |
| List price                  | \$475                 | \$458.99                                |
| Available at*               | \$279.99              | \$315.99                                |
| Reviewed in                 | —                     | 6/97                                    |
| *Prices vary with location. |                       |                                         |

save my money for more fuel and glow plugs, instead of spending it on stickier, faster-wearing tires. If you do intend to race, the Pro Thunder's one-piece 2.2 rims will accept any racing treads you like.

### TEST GEAR

My Pro Thunder arrived with a Panda radio set installed (the kit doesn't come with radio gear), but I didn't use the



## THUNDER TIGER PRO THUNDER GT

included stick transmitter because I prefer wheel-and-trigger setups. I noticed that the truck's servos use Futaba\* "J" connectors, so I thought that I would swap crystals and use one of my Futaba radios. Much to my chagrin, I found that my Futaba pistols couldn't "talk" to the Panda receiver. I pulled the receiver out of

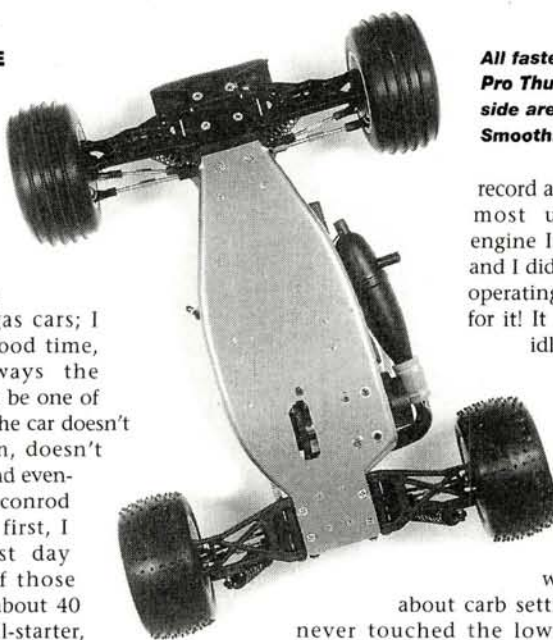
### THINGS YOU'LL NEED

- Glow-plug igniter.
- Glow fuel.
- Fuel-filler bottle.
- 2-channel radio with standard servos (or stronger).
- Paint for polycarbonate bodies.

the truck and discovered why: my transmitters are all 75MHz, and the Panda unit is 27MHz. I popped in one of my Futaba R112JE receivers, plugged in the Panda servos and all was well. The Panda S188 servos are ringers for Futaba S148s and despite being at the low end of the torque curve for this application, had plenty of "yank" power for the truck's front wheels. With the addition of some Blue Thunder\* 20-percent nitro, I was ready to go.

### PERFORMANCE

I headed out to a nearby parking lot for a motor break-in session before real testing began. For me, there's always a bit of apprehension when running gas cars; I usually have a good time, but there's always the chance that it will be one of those days when the car doesn't start, doesn't run, doesn't hold its settings and eventually throws its conrod in contempt. At first, I thought my test day would be one of those days; even after about 40 yanks on the pull-starter, the engine hadn't so much as hiccupped. It turned out that I wasn't priming it properly; I usually stop pumping the primer when I see fuel reach the carb, but the 12BZX likes two more squirts after that. With that little mystery solved, the little "twelver" ran superbly. I'll go on



**All fasteners on the Pro Thunder's underside are countersunk. Smooth!**

record and say it's the most user-friendly engine I've had yet—and I didn't even have operating instructions for it! It started easily, idled beautifully and didn't throw a lot of fuel out of the crank bearing. The 12BZX wasn't finicky

about carb settings either; I never touched the low-end needle (mainly because it's virtually inaccessible when the engine is in the car) and when the motor was up to temperature, I only tweaked the high-end needle once. I would have gladly traded off a little power for such ease of operation, but no such sacrifice was necessary. The 12BZX had



## Building & Setup Tips

"Building tips? I thought you said the Pro Thunder came assembled!" Yeah, I know. But in this case, "built" and "ready to run" are two different things. You may not have to do everything I did to get rolling, but forewarned is forearmed.

• **LOOSE PARTS.** The ball studs on the front hub carriers were ready to fall off when I pulled my pre-assembled truck out of its box. Unfortunately, the ball studs don't have any flats, so tightening them is a pain. Adding a little thread-lock is a good idea; even better, use a longer machine screw that will pass through the female ball studs, then lock everything down with a nylon locknut. Thunder Tiger will include thread-lock in production kits.

• **DIFFERENTIAL.** The Pro Thunder's ball diff felt good out of the box, but slipped easily at the track. Diff adjustment requires that tools be inserted through both outdrives; an Allen key adjusts the diff, and a bladed screwdriver holds the slotted diff nut. Both rear axles had to come out to do this, and I wasn't happy about it. I was even less happy when the diff still slipped after I had tightened it. To get rid of the slip, I had to tighten the diff screw until it actually came through the diff nut and pushed the screwdriver out! After a day's running, I pulled the differential apart to see why it was so slip-prone. I couldn't find anything resembling diff grease inside. Thin oil coated everything, and debris from cracked thrust-bearing balls littered the inside of the gearbox. In addition, the diff rings were grooved beyond any usefulness. What a mess! I cleaned everything off and rebuilt the diff with a rebuild kit from Thunder Tiger and Associated's Stealth diff lube and black grease for the thrust bearing. So far, it has been slip-free.

(Editor's note: Thunder Tiger assures us that this diff problem was caused by pre-production parts on our test truck. Production versions will have better-sealed gearboxes that will provide better protection against dirt penetration.)

• **SUSPENSION.** As mentioned in the main part of this review, Losi Red springs and 20WT Associated shock oil were added to the kit shocks. These changes were made to accommodate the stock one-slot pistons; these may not be the pistons installed in production kits, however, so check before you modify. To cure the Pro Thunder's excessive bump-steer, I removed 5mm of downtravel from the front suspension by installing spacers inside the front shock bodies. To further reduce bump-steer, I shortened the plastic rod ends used on the drag link between the steering bellcranks. This allows the bellcranks to run parallel to each other and brings the tie rod ends closer together, thereby increasing the total length from steering knuckle to bellcrank. As a final step, I installed two Associated aluminum washers beneath each steering knuckle's pivot balls. Whew!

• **BRAKES.** The Pro Thunder's disk brake is actuated by a heavy wire rod that is inserted through the brake system's mounting bracket. My truck had only about 1mm of rod protruding from the lower half of the bracket. When I applied the brakes, the rod lifted out of the hole and all braking ceased. The solution was inexpensive: I re-bent the brake rod so more wire went through the bracket, then I secured it with a model-airplane-style collar and setscrew. While I was at it, for stronger brake action, I replaced the kit's soft brake springs with sections of fuel tubing.

(Editor's note: Thunder Tiger claims that production trucks have not exhibited this problem.)

• **RADIO.** The Pro Thunder's layout calls for the receiver to be mounted beneath the radio tray; this places it in an aluminum "sandwich" between the tray and the chassis. On top of the tray, the receiver batteries are zip-tied into place. Finally, the throttle and steering servos are mounted close on the receiver, with wires running alongside—not a happy place for my AM radio gear. I experienced very limited range and lost the truck once, and that cost me a suspension arm. Check your range before you run!



**T**he Pro Thunder reaffirms one of those little life lessons: never judge a book by its cover. When I pulled the body off to start the Thunder's engine for our photo shoot, my first impression was of a lot of color-anodized aluminum parts—to my mind, a common trait of the many "knock-off" racing trucks I've seen over the years (none of which lived up to their apparent brightness). But as soon as the engine fired (which it did easily), the Pro Thunder took on a different hue.

## 2<sup>ND</sup> Opinion

Thunder Tiger's gutsy 12BZX engine is a gem. It purrs contentedly at idle and when you goose the throttle, it roars like ... well, like a tiger. Throughout the 30-minute photo shoot, the engine never once sputtered or even hinted at quitting—even during two run-ins with Mr. Short Radio Range (we must get Peter some new radio gear!), when the truck took off across a football field and slammed into (and through) a chainlink fence.

The Pro Thunder handles responsively and steers well. I was suitably impressed, but this feeling faded when I found out the Thunder Tiger isn't *that* much cheaper than an Associated RC10GT with a Dynamite .12 engine. Thunder Tiger seems to be touting the Pro as a race truck of sorts, but considering its price, I hesitate to recommend it to serious racers. I do, however, think the casual sport racer will have a good experience with the Pro; it handles well and has plenty of racing features. And that engine—can't say enough good things about it.

—Frank Masi

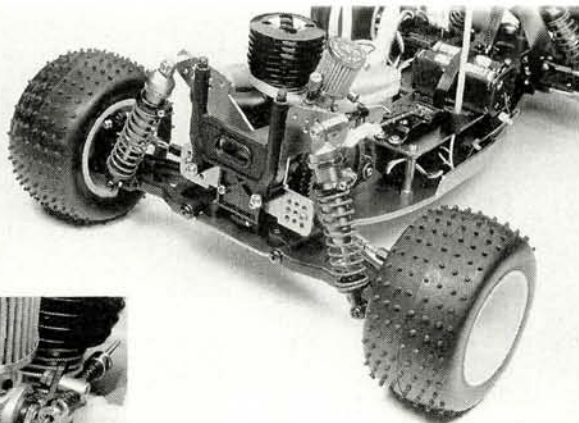
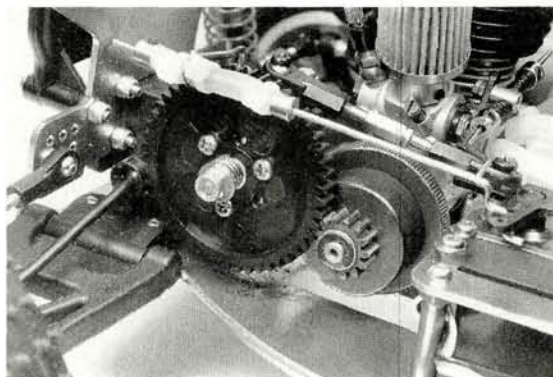
plenty of torque to spin the big truck meats and top speeds were impressive.

Once the engine had been well broken in, I went to a local park for some off-road time. I quickly discovered that the Pro Thunder's chassis setup wasn't quite up to the engine's performance level. As delivered by Thunder Tiger, the truck had very firm damping and ultra-soft springs. This combo caused the shocks to pack up over anything more taxing than smooth pavement. The stock springs simply didn't have the muscle to overcome the truck's sprung weight, and this problem was exacerbated by the excessive damping action of the shocks' one-hole pistons and heavy oil. Luckily, the solution was easy and inexpensive; I added stiffer springs (Losi\* Reds) to all four shocks and refilled the bodies with Associated 20WT shock oil. With these changes, the suspension arms could do their up-and-down shock-absorbin' thang, and the Pro Thunder was ready for real action.

The park resembled the terrain most just-havin'-fun R/C'ers will run the truck on: plenty of short grass, loose dirt, tree roots, leaves, rocks, squirrels .... You get the idea. The rough stuff pushed the truck's long-travel suspension to the limit, but it stayed shiny-side up. That doesn't mean I'd call the truck stable, however; it was all over the place! The culprit was an immense amount of bump-steer caused by the excessive down-travel of the front-end setup. When the suspension arms reached the bottom of their stroke, the steering

links pulled the front hubs into toe-out. I didn't want to stop testing for one of those parking-lot wrench sessions (no bench, pebbles stuck in your knees, body clips instantly disappear; you know what I mean), so I just drove the truck as it was. After an incalculable number of big-air jumps, dirt-spraying donuts, wide-open speed runs and about ½ gallon of fuel, the Pro Thunder showed only one sign of abuse: the rear shock tower had bent slightly—bowed would be a better word—because of the many cartwheels and upside-down landings the truck had to withstand in the course of some overzealous jumping. This didn't affect

**Right: the aluminum rear shock tower can bend during a crash, but the rest of the rear suspension is heavy-duty all the way. Below: you can see the slipper clutch and brake linkage. Note the turn-buckle brace above the clutch bell.**



bashing around the park and over any other turbulent terrain in my neighborhood. That's where the real fun is for me, and that's where the Pro Thunder really shines.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■

performance at all, and it certainly wasn't a day-ender.

## FINAL THOUGHTS

On the fun meter, the Pro Thunder scores very high, primarily because of its very forgiving, willing powerplant. Unfortunately, my preproduction truck also scored high on the frustration meter because of the many tweaks it needed to get up to speed (as noted in my "Building and Setup Tips.") In fairness, once the Pro Thunder had been set up, it ran wonderfully. That, to me, is much less exasperating than having a faultless

## Likes

- Great-looking blue-anodized parts.
- Stellar engine performance.
- Lots of features for the money.

## Dislikes

- Chassis needs lots of tweaking to reach potential.
- Unslippery slipper clutch.
- Shock towers could be tougher.

chassis but wrestling with a balky, high-strung engine. Production Pro Thunders will probably be more refined, and the truck really does have a lot going for it. As a matter of fact, I've already promised to lend mine to a local hotfinger who intends to campaign the truck in this summer's gas regionals. That's confidence! In the meantime, I'll stick with







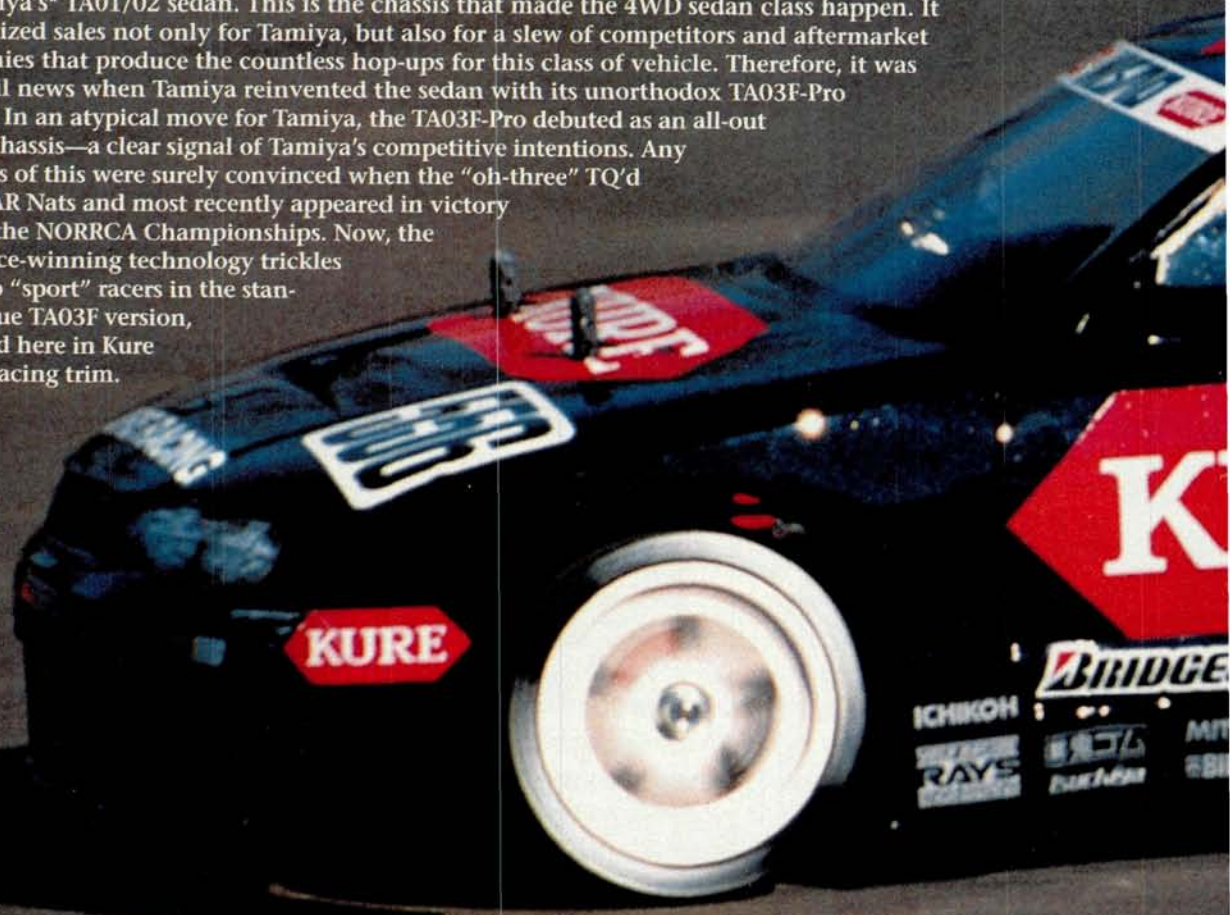
**thrash**  
**TEST**

1/10 scale electric

# TAMIYA TA03F Kure Nismo

by Peter Vieira

**I**F I WERE pressed to name one of the most influential cars of the '90s, I would pick Tamiya's\* TA01/02 sedan. This is the chassis that made the 4WD sedan class happen. It vitalized sales not only for Tamiya, but also for a slew of competitors and aftermarket companies that produce the countless hop-ups for this class of vehicle. Therefore, it was no small news when Tamiya reinvented the sedan with its unorthodox TA03F-Pro chassis. In an atypical move for Tamiya, the TA03F-Pro debuted as an all-out racing chassis—a clear signal of Tamiya's competitive intentions. Any doubters of this were surely convinced when the "oh-three" TQ'd the ROAR Nats and most recently appeared in victory lane at the NORRCA Championships. Now, the same race-winning technology trickles down to "sport" racers in the standard-issue TA03F version, reviewed here in Kure Nismo racing trim.



## The cure for parking-lot

# blues





## SPECIFICATIONS

**SCALE** ..... 1/10  
**LIST PRICE** ..... \$312

### DIMENSIONS

Length overall ..... 18.5 in.  
 Wheelbase ..... 10.1 in.  
 Width (F/R) ..... 7.1 in.

**WEIGHT** (gross, RTR) ..... 3 lb., 8.5 oz.

### CHASSIS

Type ..... Molded tub  
 Material ..... ABS plastic

### DRIVE TRAIN

Type ..... Sealed gear  
 Primary ..... Pinion/spur  
 Transmission ..... Dogbone/axle

Differential(s) ..... Bevel gear  
 Slipper clutch ..... None  
 Bearings/bushings ..... Plastic/metal bushings

### SUSPENSION (F/R)

Type ..... Lower suspension arm w/molded upper link  
 Damping ..... Oil-filled, coil-over shocks

### WHEELS (F/R)

Type ..... Two-piece plastic, adjustable  
 Dimensions ..... 1.875x1 in.

**TIRES (F/R)** ..... Tamiya standard slicks

### ELECTRICS

Motor ..... 540 stock Mabuchi  
 Battery ..... Not included  
 ESC ..... 3-step mechanical





## Building & Setup Tips

As usual, Tamiya's instructions are the best in the biz, and if you follow them precisely, you are virtually guaranteed excellent results. So does this mean I have nothing to add? Heck no! Here are my two cents:

- This one's for those of you opting to install the mechanical speed control. Regardless of what the instructions say, open the bag that contains the speed control first, then in the manual, mark the steps where it is to be installed. There's nothing more frustrating than rebuilding a car you haven't even run because you missed some steps.

- Instead of the kit grease, try lubing the gears with Aero-Car Technologies' Super Speed gear and diff lube. I've recommended this stuff in every car review I've done, and with good reason: it works. Gears run more quietly and stay cleaner with the Aero-Car lube, and for about \$5, you get enough to last through many, many applications.

- If you build the car with the included metal bushings, use Paragon's\* liquid bearings on them. This will decrease friction considerably, especially when used on the big, 15x10mm hub bushings. Stick with the kit grease for the plastic bushings.

- On step 16, Tamiya shows a pair of bare needle-nose pliers gripping an unprotected shock shaft. Oh, the humanity! There are a million things you can wrap around those shock shafts to prevent the pliers from scoring them: fuel tubing, electrical tape, a rag; choose one and use it, or the scratches you make will make your shocks weep like Richard Simmons.

- The instructions don't mention it, but Tamiya includes some extra pieces you'll want to save. The two "F" parts trees each include a 15-tooth pulley that is used to alter the front-to-rear drive ratio (see the TA03-Pro review in the October '96 issue for the scoop on tuning with pulleys). The "F" trees also include a toothed pulley for the belt tensioner; you'll need this part if you upgrade to the Pro's FRP chassis. On the "V" parts trees, keep the no. 11 spacers handy for shock-travel limiters. Whenever I build a new kit, I pick up one of those little six-compartment, plastic parts boxes, label it with the name of the car and put all the spare parts into it. This tip has made me the guy you come to at races because I always have spare screws, body clips, nuts and washers. Save your own parts, you bums!

### THINGS YOU'LL NEED

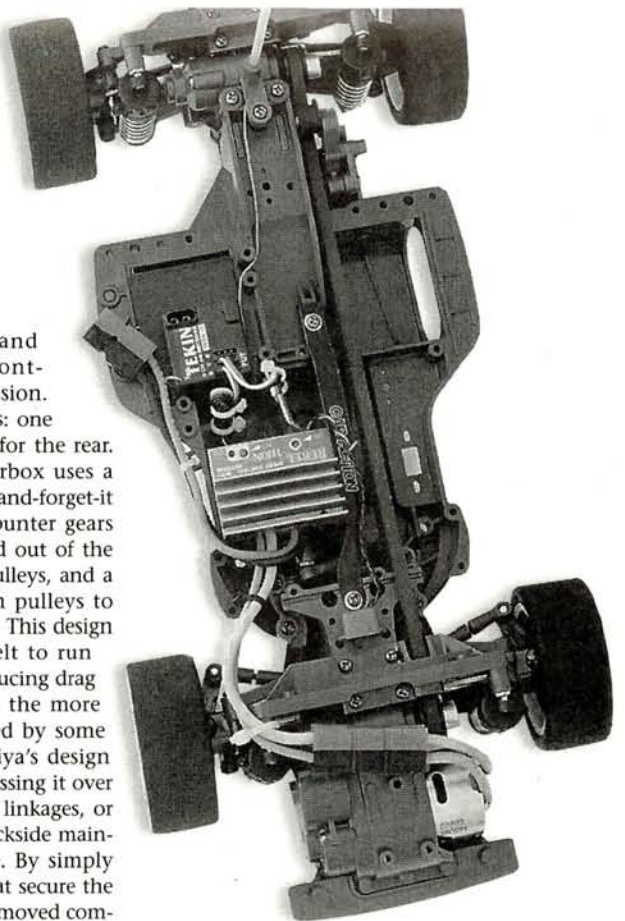
- 2-channel surface-frequency radio with two servos: one for steering, one for the mechanical speed control. Better yet, get an ESC.
- 7.2V stick-type battery pack.
- Battery charger.
- Lexan-compatible paint.

*Easily the most striking silhouette in the sedan class, the TA03 represents a bold challenge to conventional design wisdom.*

### KIT FEATURES

The TA03F's most striking and obvious features are its front-mounted motor and transmission. There are actually two trannies: one for the front wheels and one for the rear. Identical internally, each gearbox uses a counter gear to spin a built-it-and-forget-it bevel-gear differential. The counter gears are keyed to shafts that extend out of the gearboxes to accept toothed pulleys, and a single belt loops around both pulleys to connect the two transmissions. This design allows a perfectly straight belt to run along the length of the car, reducing drag considerably (compared with the more convoluted belt paths required by some other cars). In addition, Tamiya's design does not capture the belt by passing it over and under steering bellcranks, linkages, or structural parts. This makes trackside maintenance much less of a chore. By simply loosening the two setscrews that secure the drive pulleys, the belt can be removed completely in about 20 seconds! An assortment of plastic and metal bushings keeps everything spinning smoothly, but I installed ball bearings for the least possible friction.

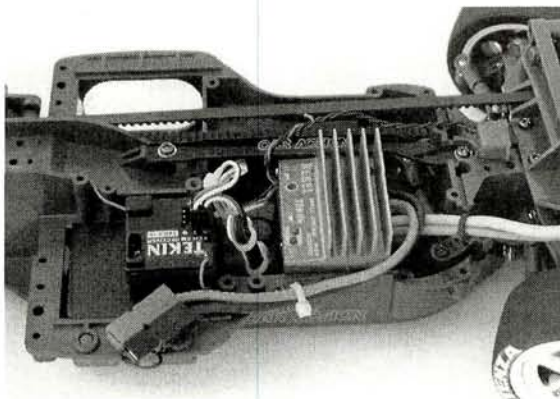
To motivate the Nismo, Tamiya supplies a 3-step mechanical speed control and the venerable 540 stock motor. The motor is bolted to the front gearbox through a slotted motor plate, (breaking the TA02 tradition of preset gear mesh). In lieu of the TA03-Pro's finer 0.4 module "metric 64-pitch" gear set, the Nismo uses 0.6 module metric pinions. Although this means fewer available gearing options, there is an advantage to the larger tooth profile of 0.6 gears: pinion/spur mesh is easier to set, and in the event of a crash, the settings are less sensitive to motor movement. Another bonus: if you invested in metric pinions for your TA02, they will mate perfectly with the '03F transmission.



Although clever, the Nismo's unique drive system is not very compact. The wide gearboxes, when combined with the car's narrow track, leave too little room for a traditional laydown shock design. Instead, the Nismo's familiar plastic-body, oil-filled shocks rise straight up from the suspension arms to the car's molded shock towers. For a very good reason, designers typically prefer to angle the shocks toward the chassis. It's subtle, but the angle diminishes the leverage of the suspension arm as it moves through its range of travel, and that, in turn, helps to limit chassis roll. In effect, the shocks get "stiffer" as the suspension arms get deeper into their travel range. In a very clever way, Tamiya manages to duplicate this effect with stand-up shocks. Instead of mounting the shock ends in line with the suspension arm's hinge pins, the Nismo

uses an offset hole well beneath the hinge pins, giving the suspension arms their distinctive "Delta box" shape. This low-pivot design makes the shocks lean inward slightly as they are compressed; the effect is apparent when compressing the shocks by hand.

*A fiberglass brace makes the plastic tub more rigid, but limits room for radio gear. A piece of scrap plastic was pressed into service as a receiver shelf.*





## TAMIYA TA03F KURE NISMO

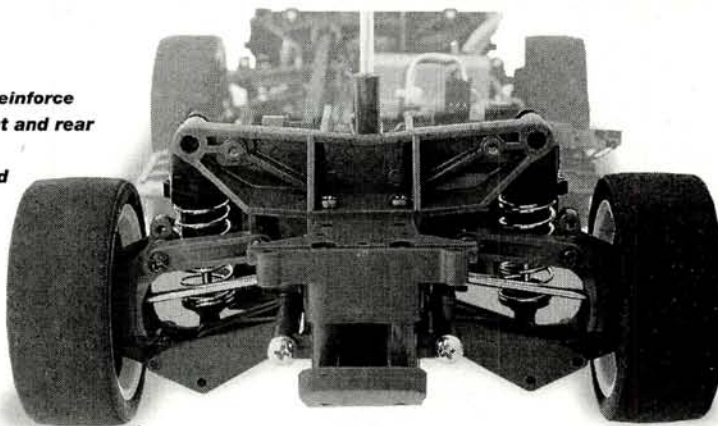
Also apparent is an excessive amount of slop in the suspension components. Because the TA03F has almost none of the same parts as TA02, I was hoping that Tamiya would have exorcised the slop demon. Given the precision with which the rest of the car is made, there really is no excuse for the suspension parts not to be as precise. I always look on the bright side, however, so I will add that when the car is subjected to those big pavement hits, the play in the suspension parts allows a little more "give." This reduces the chances of a tangle resulting in a popped arm or hub.

The gearboxes and suspension parts are hung off a familiar-looking injection molded tub, but this new version offers less room than the similar TA02 type. This is because of the drive belt (which dominates the left side of the chassis), and a fiberglass brace which runs the length of the tub.

Also, the mounting location for the battery pack is completely uncovered; there's no plastic tray above the battery pack as on the TA02 that provided ample space for electrics. I created a little extra room for my radio gear by making a receiver shelf out of a piece of scrap plastic.

In addition to providing a home for the electronics, the shelf supports a highly

**Stiffening ribs reinforce the molded front and rear shock towers. The cantilevered swaybar support isn't elegant, but it is functional. Swaybars are not included with the kit.**



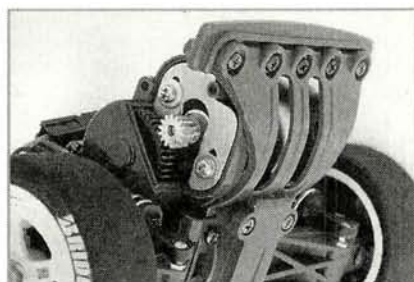
adjustable belt tensioner. This is one area where the budget racer outshines the Pro version. Whereas the Pro offers three, preset pulley positions for the belt tensioner, the sport version is infinitely adjustable. In addition, there are two locations for the tensioner on the chassis. It can be mounted on the rear behind the battery pack—as shown in the instructions—or placed directly between the gearboxes inside the tub. (Psssst ... the midship mounting position is meant to be used when the TA03 is assembled as a mid-motor car! Stay tuned to *R/C Car Action* for conversion info.)

Since this is a Tamiya car, it's no surprise

that the Kure Nismo body and wheels are crisply molded and incredibly scale-looking. As usual, Tamiya includes a remarkably comprehensive decal sheet and individually molded detail pieces, in this case, rear-view mirrors and a tall rear wing. The Nismo's wheels are especially interesting. The hub and rim are separate pieces that are screwed together. As a means of adjusting rim offset, the hub section can be mounted on either side of the rim. This allows track-width to be changed without affecting suspension geometry. There is a weight penalty, however; five steel screws per wheel add a big chunk of rotating, unsprung weight when compared to a set of one-piece rims. Relatively firm slicks at all four corners are supported by high-quality foam liners to complete the rolling stock—a good setup for smooth, clean pavement.

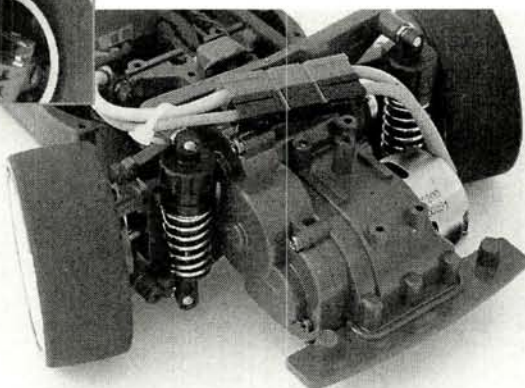
### PERFORMANCE

Believe me, a bitter New England cold snap can suck the fun out of any outdoor activity, but especially a day of R/C racing. Needless to say, I was glad when the R/C gods



**Right: unlike its predecessor (and every other sedan design), the TA03 uses a vertical shock position. Note that the shock end is mounted below the plane of the suspension arm's hinge pins; this allows the system to behave like an angled-shock layout.**

**Left: in lieu of the Pro version's 64-pitch equivalent, the TA03F uses metric 48-pitch gears. Although this limits gearing options slightly, the 48-pitch gears are easier to adjust for proper mesh and more tolerant of hard knocks.**



### FACTORY OPTIONS

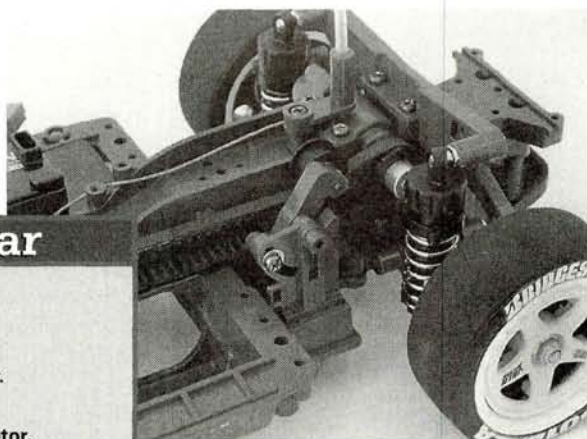
- Aluminum damper set—part no. 53155.
- Tuned-spring set—53163.
- Universal shaft set—53172.
- TA03 ball-bearing set—53265.
- Urethane bumper set—53268.
- High-torque servo-saver—50473.
- Hollow carbon gear shaft—53260.

| the Competition | Kyosho TF-2 Spider EP | Schumacher S.S.T. 2000 | Tamiya Kure Nismo | Tamiya TA02 RS  | Yokomo YR-4      |
|-----------------|-----------------------|------------------------|-------------------|-----------------|------------------|
| Wheelbase       | 10.3 in.              | 11 in.                 | 10.1 in.          | 10.1 in.        | 10.25 in.        |
| Width (F/R)     | 7.9 in.               | 7.1 in.                | 7.1 in.           | 7 in.           | 7.13 in.         |
| Weight          | 3 lb., 4 oz.          | 3 lb., 4 oz.           | 3 lb., 8.5 oz.    | 3 lb., 2 oz.    | 3 lb., 3 oz.     |
| Diff type       | Gear                  | Ball                   | Bevel gear        | Ball/bevel gear | Ball             |
| Chassis         | Graphite/alum.        | Fiberglass             | ABS plastic       | Plastic         | Black fiberglass |
| List price      | \$259.99              | \$369.50               | \$312             | \$268           | \$310            |
| Available at*   | \$189.99              | \$221.70               | \$199.99          | \$169.99        | \$269            |
| Reviewed in     | 9/96                  | 2/97                   | 6/97              | 5/94            | 8/94             |

\*Prices vary with location.



The TA03 chassis features an easily adjustable belt tensioner.



## Test Gear

- Tekin® Rebel ESC.
- Futaba® S148 standard steering servo
- Tekin AM micro receiver.
- Futaba Magnum Junior.
- Trinity® X-Star stock motor.
- Miscellaneous stick packs.

bestowed an unseasonably warm February day on us for the Nismo's parking-lot shake-down cruise. After popping in a fresh battery pack and giving a quick press of the Tekin Rebel's One-Touch Set-Up™ button, all systems were go.

I was surprised when the first yank of the trigger managed to light up all four tires. Granted, I was dealing with fresh slicks and pebbly pavement, but the tame 540 motor shouldn't pack a wallop that big. As the Nismo wound out to a less-than-ballistic top speed, it became apparent that the stock, 14-tooth pinion left the car undergeared. It wasn't sheer horsepower lighting up the tires; it was the torque of the low gear ratio. Top speed notwithstanding, the car was a treat to drive. There was just a little drift during hard cornering—enough to prevent excessive speed scrub-off but not enough to get the car out of shape. However, the 540 motor didn't really have enough power to truly illuminate the car's handling traits, good or bad. To really see what the Nismo could do, I put it up against my buddy Cid's extremely tricked-out HPI® RS4. The only changes I made to the Nismo were to the motor and gear ratio. To match Cid's Trinity Midnight powerplant, I installed a Trinity X-Star stocker, and the pinion gear was upped two teeth to a 16. This resulted in much improved top speed without any compromise in punch. The more powerful X-Star motor brought out the best of the front-motor design. Even with my hand off the wheel, when launched at full throttle, the Nismo took off straight and true (and quickly).

Unfortunately, the additional power also brought out the worst of the light rear end, causing the car to get very loose in sharp corners but it was very well-composed in the sweepers. The higher speeds allowed by the hotter motor and gearing were enough to get a wheel in the air on those pin-the-brake, cut-the-wheel, nail-the-gas hairpin turns. The Nismo's relatively long travel shocks combined with plush stock springs and soft shock oil were no doubt the cause. I'll remedy this with Tamiya's 53163 tuned spring set and some heavier oil. There won't be any hair-pulling, trial-and-error sessions

## Likes

- Like all Tamiya kits, a treat to build.
- Easy access belt with neat tensioner.
- Supple, innovative suspension.
- Excellent construction and materials.

## Dislikes

- Lots of chassis roll in stock trim.
- Tub accepts only stick packs.
- A little on the heavy side.
- Sloppy suspension components.

to sort the car out though; I'll just call 1-800-TAMIYA-A for all the setup tips, straight from factory hotshot Dave Jun. This kind of factory support is great for the consumer and for Tamiya. Helping to put TA03s in the winners' circle makes good business sense to me!

## FINAL THOUGHTS

Hissss... pop ... boy, Tamiya cars are sure fun to build ... crackle ... pop ... and durable, too. The bodies are amazing ... pop ... and the decal sheets make even Tommy Tentthumbs look like a pro ... ike a pro ... ike a pro ... ike a pro. Oops, there goes that broken record again. Haven't you ever noticed how consistent the Tamiya guys are? Every T-car I've built (and believe me, I've built a few) has been a joy from the moment the shrink-wrap came off the box. I'm almost sorry to say that the Kure Nismo, with its new TA03F chassis is no exception. Nope, no exciting news here. It didn't break. It didn't catch on fire. Nobody lost an eyeball. The car built up easily, ran beautifully and looks great, to boot. To make any car work as well as the Nismo is an achievement, but to think that Tamiya did it with an all new, completely original chassis concept is astounding. If you're looking for something truly different in a sedan that is race-worthy, easy to build, fun to drive and doesn't require two years' worth of paper-route money to afford, then the Kure Nismo should be at the top of your list.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.

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**thrash**  
**TEST**

1/10 scale electric

# TAMIYA Williams Renault

by Rick Eyrich

**W**HO'D ARGUE about Tamiya's success with its Formula 1 R/C car replicas or Frank Williams' winning percentage with his full-size F1s? In 1996, Damon Hill claimed his first world championship with the Renault-powered FW18, and it was a sure thing that Tamiya would soon reproduce the car in 1/10 scale!

This officially licensed kit can be built as Hill's champion FW18 or as the "rookie" car of Jacques Villeneuve, who is now the number-one driver at Williams Racing. Few are willing to bet on the young Villeneuve's chances of capturing the '97 world crown, but more than a few would bet on this Tamiya's on-track abilities.

## KIT FEATURES

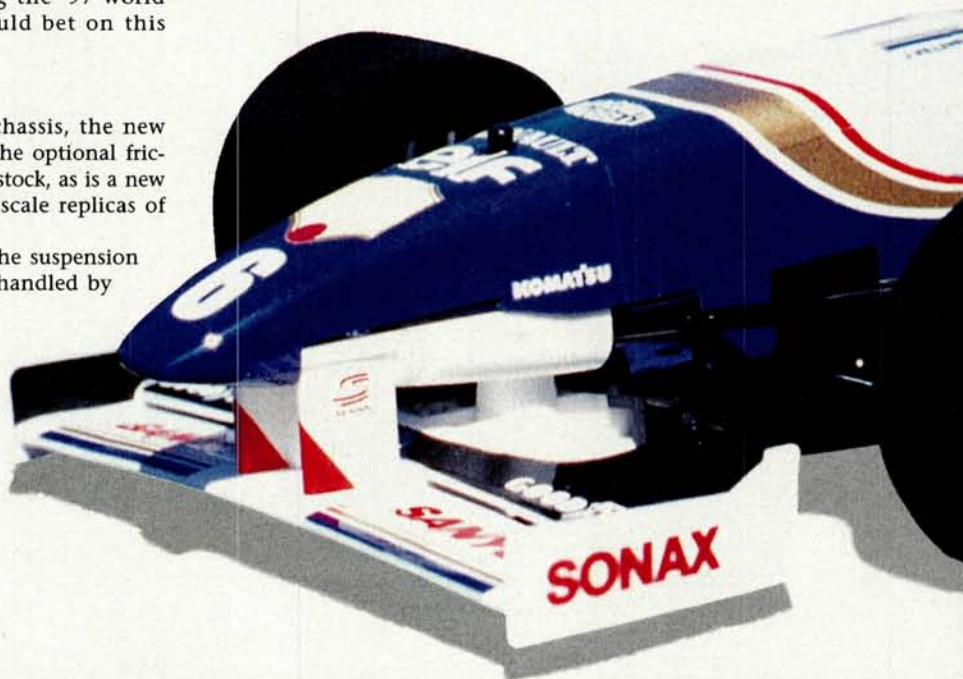
Based on Tamiya's popular F103 chassis, the new FW18 does show some additions. The optional friction-adjustable damper plate is now stock, as is a new set of front/rear spoilers (accurate scale replicas of their full-size FW18 counterparts).

Up front, coil-over kingpins do the suspension duties, and rear-end movement is handled by the aforementioned dampers, spring shock and flexible T-bar.

Of course, along with these, you still get all the great features you'll find on any Tamiya kit: super instructions, high-quality parts that fit without hassle and a polycarbonate body and graphics that are sure to impress any concours judge!

How long does it take to assemble? My basic FW18 chassis was complete—minus the radio gear—in less than two hours. Then I had to mount the foam tires on the one-piece rims and detail the wings and body shell. The main chassis work can be completed without any glitches in about four hours.

My only real gripe concerns the ball diff's thrust bearing. It's *inside* the right rear wheel; this not only makes it less accessible but also less likely to be serviced regularly. To cover my bets, before buttoning up the unit, I





## SPECIFICATIONS

SCALE ..... 1/10  
LIST PRICE ..... \$267

### DIMENSIONS

Length overall ..... 16.1 in.  
Wheelbase ..... 10.25 in.  
Width (F/R) ..... 7.9/7.9 in.

WEIGHT (gross, RTR) ..... 2 lb., 6 oz.

### CHASSIS

Type ..... Double-deck plate  
Material ..... Fiber-reinforced plastic

### DRIVE TRAIN

Type ..... Direct drive  
Primary ..... Spur/pinion gear  
Transmission ..... Solid axle  
Differential(s) ..... Adjustable ball  
Slipper clutch ..... NA  
Bearings/bushings ..... Bearings (rear); bushings (front)

### SUSPENSION

Type (F/R) ..... Sliding kingpins/floating pod w/T-bar  
Damping (F/R) ..... Coil springs/3-disk friction damper

### WHEELS

—front ..... One-piece honeycomb  
—rear ..... Two-piece honeycomb

TIRES (F/R) ..... Foam

### ELECTRICS

Motor ..... Mabuchi 540  
Battery ..... Not included  
Speed control ..... Not included



**Re-creating Damon Hill's  
Championship-Winning Ride**





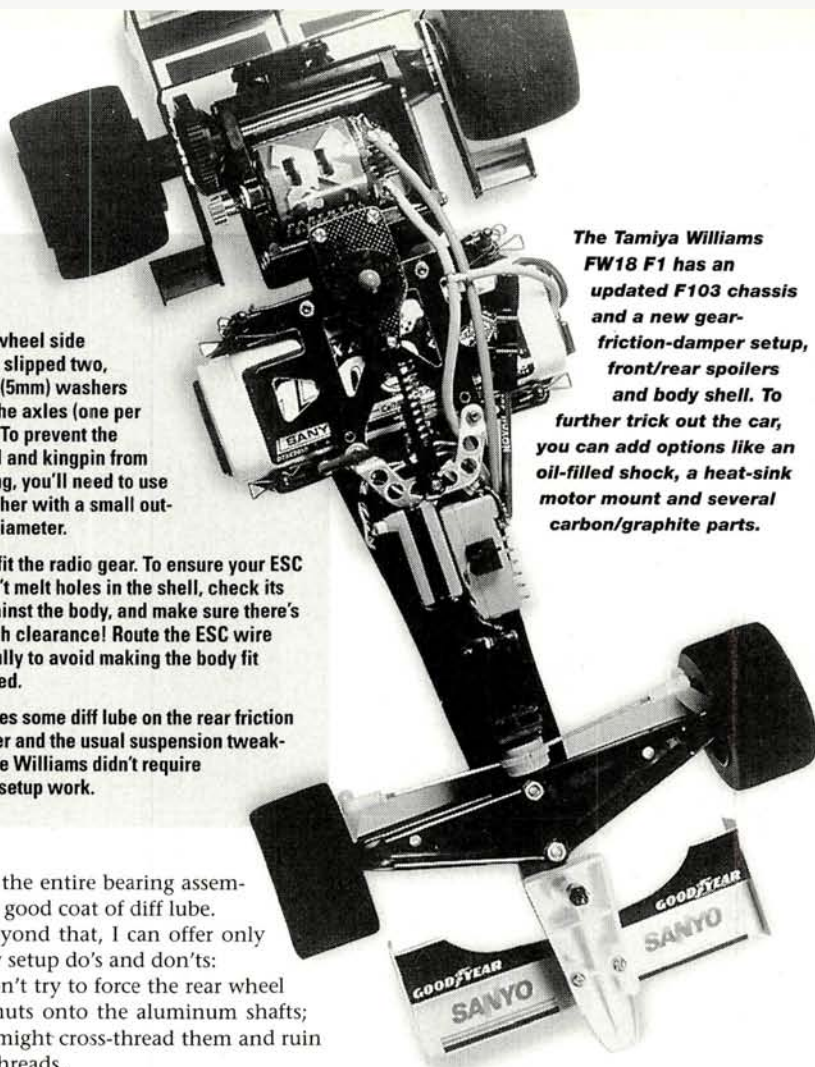
## Building & Setup Tips

- Before you start assembling, give all the chassis plates/T-bar fiber parts a good edge sanding to remove any rough edges.
- I only partially installed the motor pod screws before I attached the rear-axle/diff unit. This kept the pod straight and true when everything was in place and tightened to specs.
- I used thin CA to glue the helmet halves together and to further secure the foam donuts on the rims.
- DON'T attempt to snap the spring's shock assembly onto the mounts with your fingers! You might snap the damper-post plate. Use needle-nose pliers and BE CAREFUL.
- To avoid losing the tension nut, I put a rubber cap on the threaded friction-damping post. You could also use a dental-brace rubber band or an O-ring to help secure the nut. To reduce the front

axle/wheel side play, I slipped two, small (5mm) washers onto the axles (one per side). To prevent the wheel and kingpin from binding, you'll need to use a washer with a small outside diameter.

- Trial-fit the radio gear. To ensure your ESC doesn't melt holes in the shell, check its fit against the body, and make sure there's enough clearance! Route the ESC wire carefully to avoid making the body fit crooked.
- Besides some diff lube on the rear friction damper and the usual suspension tweaking, the Williams didn't require much setup work.

The Tamiya Williams FW18 F1 has an updated F103 chassis and a new gear-friction-damper setup, front/rear spoilers and body shell. To further trick out the car, you can add options like an oil-filled shock, a heat-sink motor mount and several carbon/graphite parts.



## FACTORY OPTIONS

- Aluminum motor mount—part no. 53106.
- Carbon-graphite chassis plate—53168.
- Turnbuckle tie rods—53150.
- Flex T-bar set—53169.
- Formula link-type front suspension—53258.
- Aluminum low-friction damper plates—53173.

gave the entire bearing assembly a good coat of diff lube.

Beyond that, I can offer only a few setup do's and don'ts:

—Don't try to force the rear wheel locknuts onto the aluminum shafts; you might cross-thread them and ruin the threads.

—Don't take for granted that the rear motor pod goes together in only one way. Be sure to follow the kit's instructions carefully.

—Do take the extra time to trim and fit the graphics correctly on the Williams shell. The results are impressive!

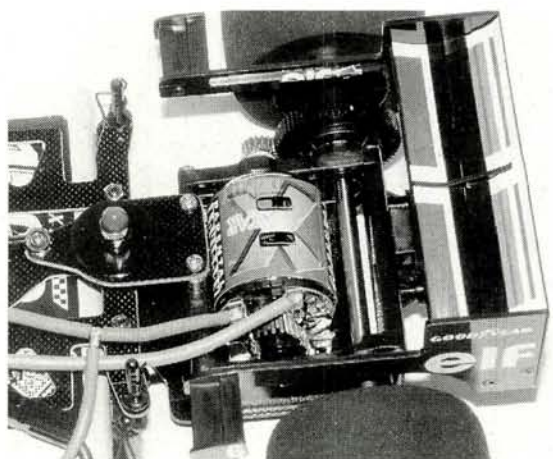
## TEST GEAR

A regular Futaba\* S148 servo was assigned to the Tamiya's steering duties, along with the stock servo-saver and tie rods. Instead of using the kit's Mabuchi 540 powerplant, I went with one of Trinity's\* new X-Star ROAR

stock motors—purely because of my need for power, which the X-Star has in spades! I stayed with the kit's pinion, which gave the FW18 about 6 minutes of all-out-speed run time on the 6-cell DuraTrax\*\* 1500 pack.

I chose a new Novak Electronics\* Cyclone ESC because it's small but offers big-time performance. Its One-Touch Set-Up™ button makes setup easy, and you can choose one of three distinct "power curves" to suit your RC vehicle. Throw in Novak's comprehensive service manual, parts bag and twin decal sheets and bingo!—a high-tech ESC for all!

My Futaba PCM1024 transmitter and Novak NER-FM receiver complete the



The rear axle has sealed ball bearings, an adjustable ball-diff unit and an adjustable-roll-rate T-bar plate. The standard aluminum axle hubs are "lock-set" in recesses cut into the steel axle. Even with the kit pinion gear, the Trinity X-Star motor provides ample power and run time. Notice the small rubber cap on the tip of the threaded damper post; this prevents the post's adjustment nut from coming adrift at the wrong time!

## the Competition

|                | Tamiya Williams-Renault | HPI Super F1    | Kyosho Impress |
|----------------|-------------------------|-----------------|----------------|
| Wheelbase      | 10.75 in.               | 9.875 in.       | 9.8 in.        |
| Width (F/R)    | 7.9/7.9 in.             | 7.9/7.9 in.     | 7.9 in.        |
| Weight         | 2 lb., 6 oz.            | 2 lb., 10.3 oz. | 2 lb., 2 oz.   |
| Diff type      | Adjustable ball         | Ball            | Ball           |
| Chassis        | Double-deck F103RS      | Graphite        | Fiberglass     |
| Price          | \$267                   | \$285           | \$199          |
| Available at*  | \$179.99                | \$179.99        | \$124.99       |
| Issue reviewed | 6/97                    | 8/95            | 2/95           |

\*Prices may vary with location.



## Likes

- Updated chassis suspension gives much better handling.
- Easy to build—typical of Tamiya!
- The licensed body and graphics make it a concours winner.
- Great performer right from the get-go.

## Dislikes

- Rear-wheel thrust-bearing setup hidden inside hub.
- Battery space kinda tight!
- Have to tweak rear wing/antenna to mount body.

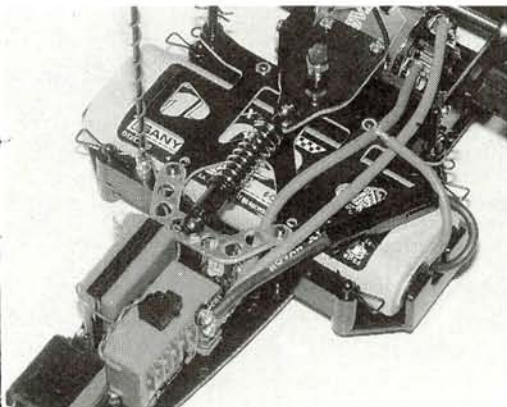
radio package. It's important to note that no matter which radio gear you use with this vehicle, you'll have to check your ESC/receiver locations *with the body mounted on the chassis*. The Williams shell wraps tightly around the lower frame plate, and that leaves little room for mounting the electronics.

Tamiya doesn't include any damping grease for the rear pod; some RC'ers use diff lube while others rely on Teflon™ tape or pads. I chose Associated's\* no. 6591 Stealth diff lube for both friction plates.

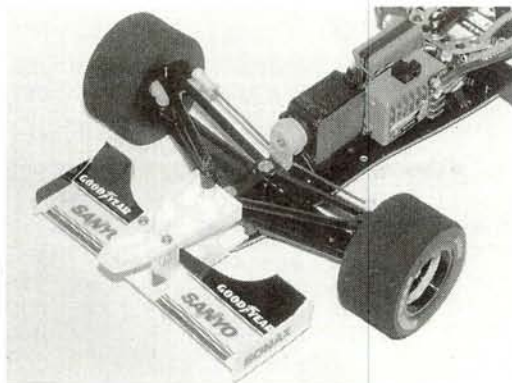
Finally, I adjusted the T-bar screws and nuts to the 1mm setting (on the friction post nut/shaft) specified in the manual and was then ready for the test runs.

### PERFORMANCE

There aren't any R/C roadcourses where I live, so I headed to a local bank's parking lot. Its asphalt surface was smooth, and I used its many small islands to lay out a makeshift roadcourse. The asphalt was covered with a fine layer of Florida sugar sand, but not enough to worry about.



The battery holder was designed for 6-cell stick packs like the DuraTrax/Sanyo unit shown here. To ensure the body shell lies flat, take care when you route the ESC's battery and motor leads and install the radio gear.



The twin-wishbone arm/kingpin sprung front-suspension setup gives this 1/10-scale plenty of quick steering over the bumps. A standard-size servo is recommended; I mounted a Futaba S148.

### THINGS YOU'LL NEED

- 2-channel radio.
- Steering servo—standard size.
- Electronic speed control.
- 7.2V stick-style Ni-Cd battery.
- Battery charger.
- Paint for the Lexan body.

Before doing any hot laps, I ran a few slow circuits to move the grit off the "preferred racing lane." At speed, the car's steering and roll rates were excellent; it would take a lot of effort to traction-roll this beauty. When I locked the steering at full throttle, there wasn't even a hint of the FW18 doing a two-wheel stunt!

The Cyclone ESC/Trinity motor combination proved to be a good match for the Tamiya open-wheeler. I had to loosen the ball diff because the X-Star motor had a ton of torque—much more than the kit motor. Straight-line speed and stability were above par—no nasty handling traits. For this, I credit the car's high-downforce front and rear spoilers.

### FINAL THOUGHTS

If you're used to piloting a FWD or 4WD sedan, you might find the Williams F1 racer a bit more "active" than they are. Its low weight, low profile and quick handling make it a more cut-and-thrust competitor—not unlike the full-size Williams.

So if you imagine yourself pitting your cornering skills against Damon Hill, slip-streaming past Jacques Villeneuve or just out-dogfighting your R/C buddies, consider the new FW18 Tamiya. It could just convert your daydream into virtual reality!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■

# SANYO

## How can I Recycle?

There's no way to overstate the importance of recycling used Ni-Cd batteries. Everyone who uses them has a responsibility to the environment, future generations and the continuation of the R/C hobby to recycle their old batteries. Throwing batteries into the trash will lead to pollution of the fields and streams as the Ni-Cd makes its way from the dump site to our water supplies. This is a long-term problem. The short-term problem is that if an industry that uses Ni-Cd batteries fails to observe the recycling laws, they face a banning of Ni-Cd use. This means throwing batteries into the trash and selling illegal imported cells that cannot be recycled because the importer paid no fees for a recycling program, and it could lead to the end of the R/C industry and hobby. The solution to both problems is to buy and sell only cells with the RBRC seal, as they can be recycled, and you yourself must make the effort to recycle your used batteries.

To help the R/C consumer, the RBRC has made recycling these cells a lot easier. The dollars collected for the RBRC seal that appears on all legal batteries fund a recycling program that will pay all the expenses for you to recycle your old cells. The RBRC is sending eye-catching, counter-top collection boxes to all the R/C hobby shops and tracks in the country (shipped at the RBRC's expense). When assembled, these boxes display the RBRC logos and all the necessary recycling information. Drop your old cells through the slot in the top of the box, and you have met your recycling obligations—quick and easy; that's all there is to it.

When the recycling collection box is full, the hobby shop simply seals it, calls the number on it for the carrier to pick it up and the job is done. The RBRC collection boxes come addressed and with return postage, so there is no cost to consumers or dealers. It couldn't be easier!

So don't risk your environment or your hobby by incorrectly disposing of used batteries; recycle now or pay the price later.

For more recycling information, call these numbers:

Consumer: (800) 8-BATTERY  
Retailer: (770) 984-0708

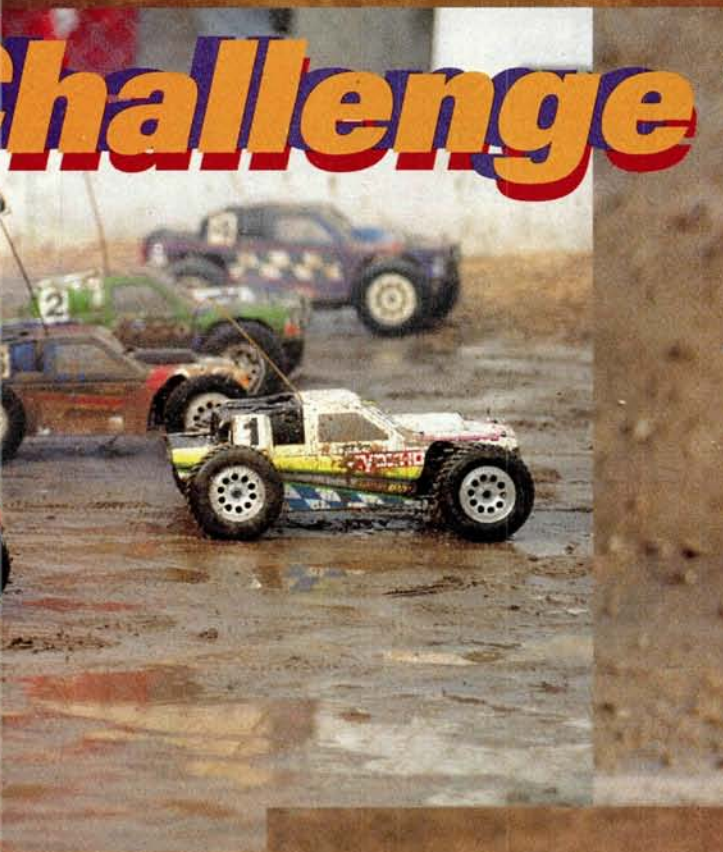
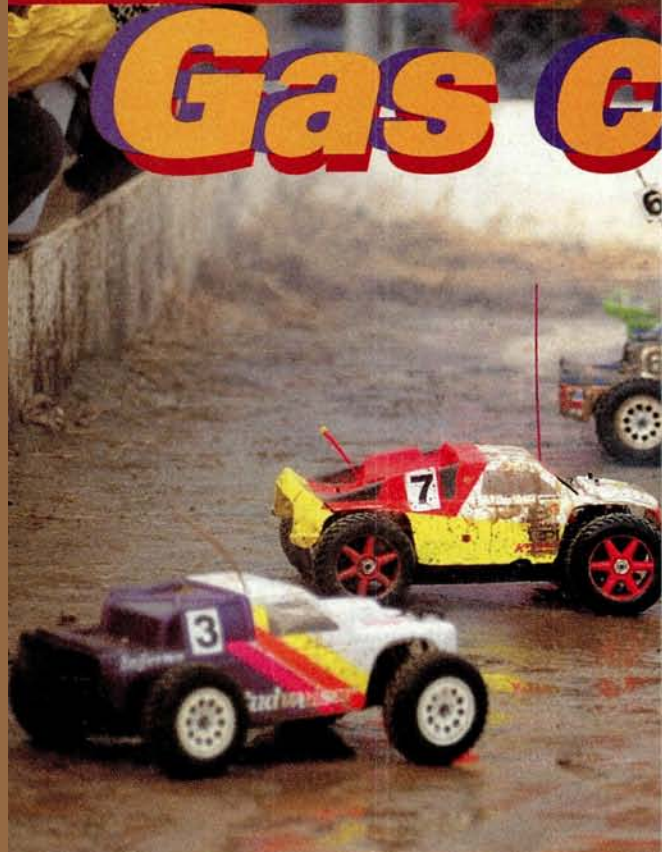
ADVERTISEMENT





**West** Coast

# Gas Challenge





# NITRO MEETS SUPERCROSS

IN SOUTHERN CALIFORNIA



Is that duct tape all over the chassis?  
This is what you call "mud prep."

by A.R. Flatbush

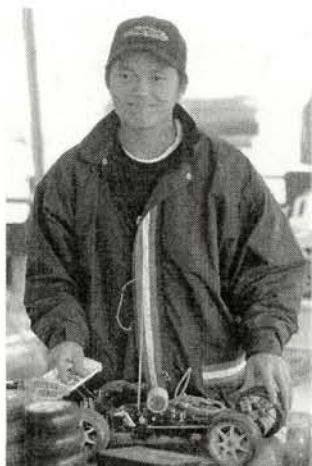
**I**T ISN'T MERELY coincidence that the 1997 R/C car and motorcycle supercross racing seasons kicked off almost simultaneously in Southern California. While most of the nation—and the world—is buried under snow, sleet, or ice, California winters are either sunny or threatening to be sunny, so it's the natural place for gearheads to congregate.





## WEST COAST GAS CHALLENGE

Valley R/C Race Park in Hemet, CA, hosted the '97 Kyosho West Coast Gas Challenge, and the track that greeted the 170-plus competitors looked more like a motorcycle supercross track than your normal off-road race circuit. A 4-foot-high, 10-foot-long tabletop dominated the infield portion of the track, and there were moguls, double-doubles (hold the mayo), off-camber turns, a downhill double and other supercross-bred obstacles. The track was mega-gnarly by design ... then the rains came. It became a quagmire (with one section that had been dug out to make the tabletop become a "sippy hole," like you see on TNN's swamp buggy competitions), and then dried out just as quickly when the rain stopped. Like AMA Supercross, the Gas Challenge races are run rain or shine, so there were some pretty innovative ways to beat the mud and water, and racers were kept busy cleaning their gas guzzlers. *Extremely* busy. Many times, the race announcer was



**Derek Furutani is a regular at Valley R/C Park. He also put on quite a show during the event.**

reduced to saying, "We have a brown car in the lead, folks!"

### QUALIFYING FOR THE PROGRAM

The racers struggled through three rounds of qualifying on the sometimes slick, sometimes gummy, always rough stadium track, and there were a couple of more similarities with motorcycle supercross. One was the IFMAR qualification system, which seeded drivers from the lesser Mains into the A-Main in each class. This advancement system is much like the old AMA supercross format, in which the top finishers in the heat races advance to semifinals, then the top finishers in the semis go on to the Main. The IFMAR system seeds the top two qualifiers directly to the A-Main, while the other eight had to advance through from the

E-, D-, C- and B-Mains. Talk about a challenge!

The first two days consisted of three rounds of 7-minute qualifying heats to determine the TQ and runner-up in each division. Tire selection and suspension setup were total guesswork at times, as the rain started and stopped repeatedly, as if to tease the competitors. "Do I increase pre-load to counter the weight of the mud, or do I keep it low to fight the incredible sidebite on the racing groove?" "Will it be snotty or gummy when my heat begins?" "Do I use a step-pin or Fuzzie?" Diff and slipper adjustment were nightmarish—too loose and you cook it, too tight and you're wall-banging. Many racers were seen gobbling Tylenol as



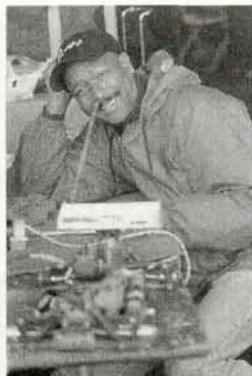
# NITRO'S HOTTEST SHOWROOM



When you want to browse around gas racing's hottest showroom, start up your internet browser. Log onto the Team Serpent Network web site and find out how the Power-Start starting box effortlessly fires up a gas car or truck. Learn why ROAR champs and the Worlds T.Q. choose Mega engines. See which Impact-2 features make it such a 1/10-scale racing force. Or discover why the Vector is simply the most advanced R/C car ever made. If you're into gas, get into TSN – Because the keys to unlock nitro's hottest showroom are at your fingertips.







**Eustace Moore takes a breather.**

though they were Skittles.

As always, the most prepared and savvy rose to the top. TQ'er Greg Hodapp took his Losi GTX to a 17/7:09.32 in 1/10-scale Stadium Truck, with Mark Pavidis turning a 17/7:12.45

with his Associated GT. Hodapp proved to be the man to beat in 1/8-scale Stadium Truck, too, turning a 17/7:24.69 with his FTD/MIP 4WD. FTD teammate Derek Furutani was second, turning in a 16/7:01.92. Although the tight track seemed more suited to the long-legged 1/10-scale stadium trucks, the 1/8-scale buggies ripped around and over the obstacles like low-flying aircraft. Mark Pavidis put in a blistering 19/7:24.38 with his Mugen Seiki Super Athlete to become TQ. Furutani was second with a Kyosho MP5, doing an 18/7:05.61. Defending buggy champ Cliff Lett would have to advance

through the program like everyone else.

New for 1997, the 1/10-scale 4WD buggies didn't draw enough entries to require qualifying. All went directly to the 15-minute A-Main. The 4WD stadium trucks would run a 30-minute Main, while 2WD trucks and 1/8-scale buggies would duke it out for a whole hour! Can you say, "Pit strategy"?

#### TAKE THE A-MAIN UPTOWN

• 1/8-scale Stadium Truck. Disaster nearly struck Furutani during the warmup, as his truck dropped its clutch and he had to scramble to replace it before the starting buzzer. He barely made it to the drivers' stand in time. TQ'er Hodapp got the holeshot and set the pace. Furutani and B-Main winner Tim Long took turns making runs on Hodapp. The downhill doubles and huge tabletop were taking a toll on the two as they

tried to reel in Hodapp, and the incredible sidebite caused everyone to roll and bicycle around the track. The turn marshals got a workout, for sure. Furutani flamed out three times during the race, so Hodapp concentrated on "keeping it on its wheels." He soon lapped the whole field, so Derek and Tim settled into a battle. At the buzzer, Hodapp slipped by just

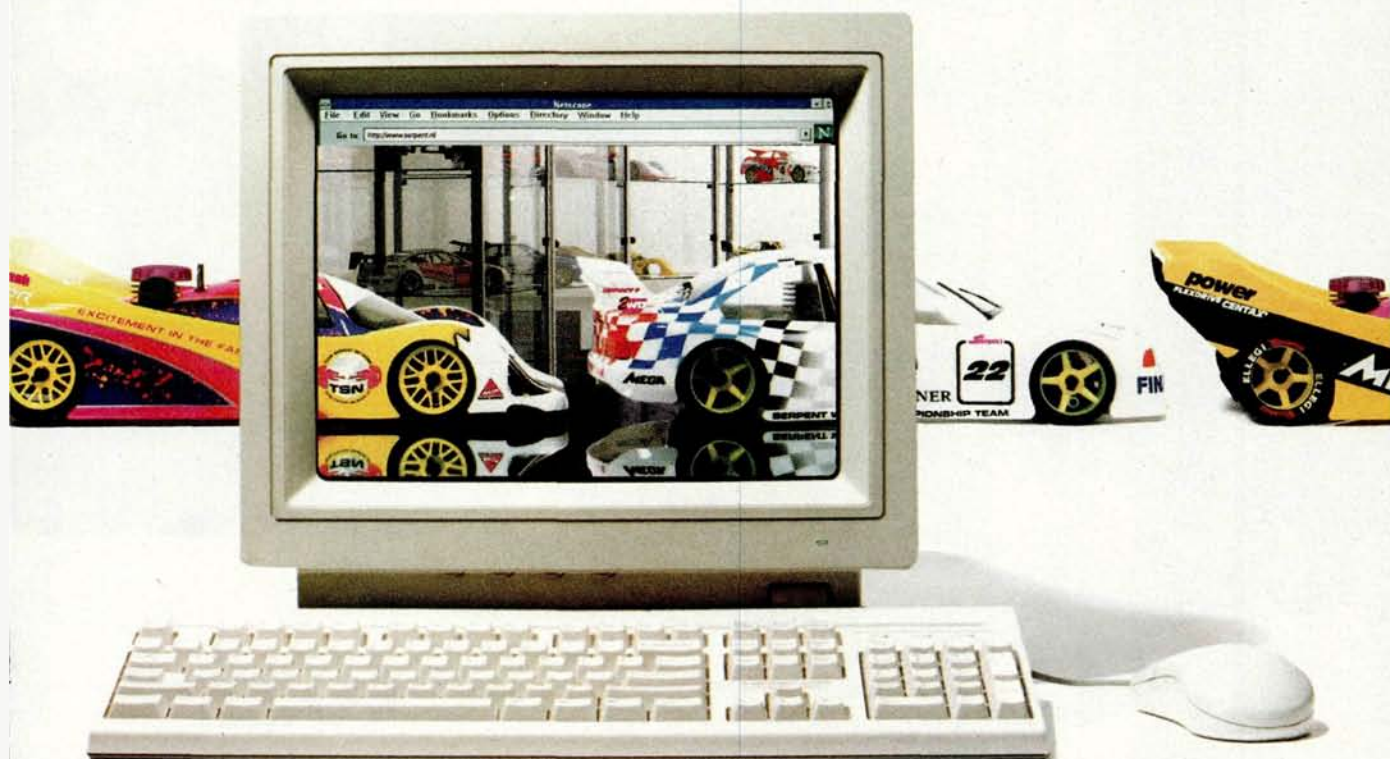
in time to turn in a 65/30:25.30, while Furutani did a 63 and Long a 62. Ninth qualifier Gary Kyes was fourth with 61 laps.

• 1/10-scale Stadium Truck. TQ'ers Hodapp and Pavidis waged war through the first half of the A-Main, swapping paint and positions several times. Meanwhile, Lett and Austin Dvorak had a battle of their own, and Richard Saxton was methodically moving through the pack. Saxton had moved up from the D- and B-Mains, so he simply continued the charge to the front. He got around the Lett/Dvorak battle and set his sights on the



**Mark Pavidis put on a good show during the weekend of hard racing. He ended up in second place in 1/8-scale Buggy and 1/10-scale Truck.**

## AND YOU'VE GOT THE KEYS.



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**Serpent**  
EXCITEMENT IN THE FAST LANE



## WINNERS

**1/8-Scale Stadium Truck**

| Fin. | Qual. | Driver          | Chassis     | Engine      | Pipe      | Fuel         | Radio      | Tires (F/R) |
|------|-------|-----------------|-------------|-------------|-----------|--------------|------------|-------------|
| 1    | 1     | Greg Hodapp     | FTD Truck   | O.S./Dremel | Paris     | O'Donnell    | Airtronics | Kyosho      |
| 2    | 2     | Derek Furutani  | FTD Truck   | Rex         | Paris     | O'Donnell    | Airtronics | Kyosho      |
| 3    | 3     | Tim Long        | Kyosho      | Rex         | Kyosho    | O'Donnell    | Sanwa      | Kyosho      |
| 4    | 9     | Gary Kyes       | Turbo Burns | O'Donnell   | O'Donnell | O'Donnell    | Airtronics | Kyosho      |
| 5    | 4     | Scott Parkes    | Kyosho      | O.S.        | Paris     | Byron        | Futaba     | Kyosho      |
| 6    | 10    | Ron Bechard     | Kyosho      | Paris/Picco | Kyosho    | Blue Thunder | Airtronics | Kyosho      |
| 7    | 7     | Caillen Kanekoa | Kyosho      | O.S.        | Paris     | O'Donnell    | Futaba     | Kyosho      |
| 8    | 5     | Steve Ozuna     | Inferno     | Paris/Picco | Paris     | Byron        | Airtronics | Kyosho      |
| 9    | 6     | Mike Fox        | Kyosho      | Paris/Picco | Paris     | Blue Thunder | Airtronics | Kyosho      |
| 10   | 8     | Jim Williams    | FTD Truck   | O.S.        | Kyosho    | O'Donnell    | Futaba     | Kyosho      |

**1/8-Scale Buggy**

| Fin. | Qual. | Driver           | Chassis | Engine     | Pipe            | Fuel         | Radio      | Tires (F/R) |
|------|-------|------------------|---------|------------|-----------------|--------------|------------|-------------|
| 1    | 3     | Cliff Lett       | Kyosho  | Picco      | Paris           | Blue Thunder | Airtronics | Kyosho      |
| 2    | 1     | Mark Pavidis     | Mugen   | Rex        | NovaRossi/Mugen | O'Donnell    | Airtronics | Kyosho      |
| 3    | 7     | Yuichi Kanai     | Kyosho  | O.S.       | Kyosho          | FSR          | Sanwa      | Kyosho      |
| 4    | 2     | Derek Furutani   | Kyosho  | Rex        | Rex             | FSR          | Airtronics | Kyosho      |
| 5    | 6     | Jon Hazlewood    | Kyosho  | O.S.       | Kyosho          | FSR          | Futaba     | Kyosho      |
| 6    | 4     | Richard Saxton   | Mugen   | Rex        | Mugen           | O'Donnell    | Airtronics | Kyosho      |
| 7    | 5     | Kris Moore       | Kyosho  | O.S.       | AL 650          | O'Donnell    | KO         | Kyosho      |
| 8    | 9     | Mike Craddock    | Kyosho  | O.S.       | Kyosho          | FSR          | Sanwa      | Kyosho      |
| 9    | 8     | Steve Dunn       | Kyosho  | O.S./Turbo | Paris           | Blue Thunder | JR Propo   | —           |
| 10   | 10    | Hideki Kobayashi | Kyosho  | O.S.       | Kyosho          | FSR          | Sanwa      | Kyosho      |

**1/10-Scale Stadium Truck**

| Fin. | Qual. | Driver          | Chassis    | Engine         | Pipe       | Fuel         | Radio      | Tires (F/R)   |
|------|-------|-----------------|------------|----------------|------------|--------------|------------|---------------|
| 1    | 7     | Richard Saxton  | Associated | O.S.           | Associated | O'Donnell    | Airtronics | Pro-Line      |
| 2    | 2     | Mark Pavidis    | Associated | O.S.           | Associated | O'Donnell    | Airtronics | Pro-Line/Losi |
| 3    | 6     | Austin Dvorak   | Associated | O.S.           | Associated | O'Donnell    | Airtronics | Pro-Line      |
| 4    | 4     | Cliff Lett      | Associated | O.S./Johnny    | Associated | O'Donnell    | Airtronics | Pro-Line      |
| 5    | 5     | Jon Anderson    | Losi       | O.S.           | O'Donnell  | O'Donnell    | Futaba     | Losi          |
| 6    | 8     | Steve Dunn      | Losi       | Dynamite/Paris | Paris      | Blue Thunder | JR Propo   | Losi          |
| 7    | 10    | Albert Guardado | Losi       | O.S.           | Losi       | O'Donnell    | Airtronics | Losi          |
| 8    | 3     | Gabe Boudreau   | Losi       | O.S.           | Losi       | O'Donnell    | Airtronics | Losi          |
| 9    | 9     | Greg Degani     | Losi       | RBW Racing     | Paris      | O'Donnell    | Futaba     | Pro-Line/Losi |
| 10   | 1     | Greg Hodapp     | Losi       | O.S.           | O'Donnell  | O'Donnell    | Airtronics | Losi          |

**1/10-Scale Buggy**

| Fin. | Qual. | Driver      | Chassis | Engine | Pipe     | Fuel      | Radio    | Tires (F/R) |
|------|-------|-------------|---------|--------|----------|-----------|----------|-------------|
| 1    | 1     | Tim Bump    | OFNA    | OFNA   | Paris    | —         | —        | OFNA        |
| 2    | 2     | Dave Henry  | Kyosho  | O.S.   | Kyosho   | FSR       | Futaba   | Kyosho      |
| 3    | 4     | Greg Walter | Kyosho  | O.S.   | Duratrax | O'Donnell | JR Propo | Kyosho      |
| 4    | 3     | Peter Head  | Kyosho  | O.S.   | Kyosho   | FSR       | KO Propo | Pro-Line    |

leaders. Quick pit stops and turn-marshalling kept the competition at a fever pitch, and the track was holding up well. Hodapp, unfortunately, started having servo problems halfway through the Main.



**Life on pit lane.** With Mains that lasted more than an hour, you can bet this area got a lot of traffic during the weekend.

Saxton slipped past the leaders, so it was Hodapp's and Pavidis' turn to reel in the new leader. By the three-quarters mark, Hodapp was having to stop and reset his servo constantly, and Dvorak settled into a battle with Pavidis. The leaders had lapped some racers 15 times, and traffic was chaotic. Saxton slipped away and took the win with a hard-fought, 131/60:25.89. Pavidis hid from Dvorak at the end, with both turning 130 laps. Lett was another lap down, and he was not a happy man. He vowed revenge in 1/8-scale Buggy.

• **1/8-scale 4WD Buggy.** The skies opened up yet again at the end of the 1/8-scale Buggy B-Main, and turn marshals for the A-Main were suddenly scarce. Track workers volunteered to marshal the

**Cliff Lett works on his GT. Cliff won 1/8-scale Buggy the hard way. This marks the second year in a row that Cliff has won this championship.**



slick track, hoping they wouldn't end up on "America's Funniest Home Videos." Luckily, it was too dark. The track was incredibly rough by this point, and TQ'ers Pavidis and Furutani were at a disadvantage compared with those who had been in the B- and C-Mains. Still, Pavidis found

(Continued on page 197)







# Tipping

## How to Find the Hidden Weight in your Buggy or Truck by Doug Mertes

**D**O YOU KNOW how much your off-road truck or buggy weighs? Sure, you probably have a good idea of how heavy it is when it's loaded up and ready to scorch the competition; after all, to keep everyone honest, most tracks use some sort of electronic scale at the tech table. But do you know where all that mass is?—where the heavy parts are and what you can do to juggle that weight so that it will do you the most good? Read on; I'll give you something to think about late at night while you're contemplating how to get a few tenths per lap ahead of the next guy.

### WEIGHT CATEGORIES

Let's start by discussing the three weight categories: sprung, unsprung and rotating:

#### ■ Sprung weight

This includes everything that's supported by the suspension: the chassis, the electronics, the motor, the batteries, the steering linkage, the body, the shock towers, etc. A portion of the suspension arms, linkages and shocks is also considered as unsprung weight. There's a lot more sprung weight than unsprung weight, and that's a good thing. The chassis of a car with insufficient sprung weight will bounce all over the place and will be almost impossible to drive accurately.

#### ■ Unsprung weight

This includes many of the parts that make up a vehicle's suspension system. If you aren't sure exactly what I'm talking about, remove the springs from all four shocks, and support the chassis on a block of wood or a couple of tires. Now lift and drop each wheel while checking everything that moves: suspension arms, shock shafts, dogbones, wheels and tires, hub carriers and spindles, upper links, etc. These items are mainly unsprung weight.

#### ■ Rotating weight (mass)

This consists of things that, well, rotate or spin: dogbones, differentials, transmission shafts, axles and bearings. They can be either unsprung (wheels and tires) or sprung (motor armatures).

Now that you know something about the different types of weight, how can you use the information to make your car run faster and handle better?

*The Pelouze electronic scale is available at large office-supply stores. It reads in increments of 2/10 ounce—about what a pair of off-road shock springs weighs.*



### LESS BOUNCE

Unsprung weight will react to all kinds of imperfections: ruts, bumps, jumps and table-tops. Reduce unsprung weight, and your car or truck will be more able to handle whatever the track dishes out. Lighter suspension assemblies will react more rapidly to surface irregularities, and your shocks will damp the compression and rebound strokes with more precision.

The heavy items in this category are wheels and tires: a mounted wheel and tire from a racing truck weigh anywhere from 3 to 5 ounces, depending on rubber compound and tread design. Multiply that weight difference by four (four tires on a vehicle), and you'll appreciate why it pays to check tire weight if you want to maximize track performance.

If you already run a race-ready setup, you'll have to work at reducing mass a little at a time to save a substantial amount of weight, but it will pay off. If you install lightweight parts—dogbones, suspension arms—and choose aluminum screws and mini or plastic locknuts, you'll reduce unsprung weight by almost 1/2 ounce at each corner. Trust me; the improvement in handling will be noticeable! Individually, lightweight parts, e.g. titanium turnbuckles and hinge pins, may not save much weight, but if you replace every steel turnbuckle or hinge pin with a lighter one, the reduction can amount to more than 1/2 ounce. What's more, titanium is much, much harder to bend or break.



# the Scales

**Above left:** it's quiz time: which turnbuckle weighs more?—the larger one on the left or the smaller one on the right? If you think the smaller one weighs more, you're correct! The larger one is titanium, which weighs roughly one third the weight of steel and is three times as strong. If you replace all your steel turnbuckles with titanium ones, you'll shave a lot of weight off your car. **Above right:** today's stock and modified motors weigh a minuscule amount more than their predecessors, but they offer much, much more speed. **Right:** graphite composite pieces are not only lighter, but they're stronger than the stock pieces, too.

## BODY FAT

OK; this is the big stuff—individual assemblies that affect performance as an anchor affects a boat. Think that motors all weigh the same? Guess again. A slow Mabuchi 540 weighs in at 5.8 ounces, a much faster Trinity Green Machine 2 or an older Yokomo stocker hits the scales at 5.4 ounces, and a Trinity Midnight and Reedy Firehawk at 5.6 ounces.

Stronger magnets and a thicker can do more than just produce more horsepower; an older, Trinity Epic can-based modified motor weighs 6 ounces, but a much newer—and much faster—Trinity Team Edition modified makes the scales groan at 6.6 ounces. That's good to remember when you're changing motors between heats. Install a motor that's ½ ounce lighter, and your vehicle may be too light when you visit the tech table after the race.

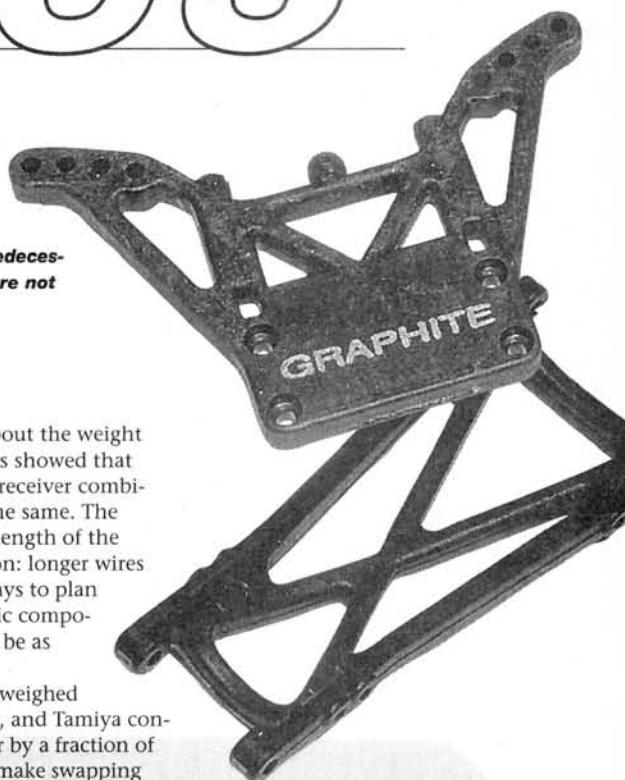
But motors aren't the only porky items you can find on the chassis. How about batteries? All the same—right? I mean ... hey, they're all the same size. Check out these facts: a cheapo sport pack weighs in at 10.8 ounces, including the connector, but a 6-cell 1400SCR Sanyo side-by-side pack tips the scales at 11.6 ounces—just like a stick pack made of the same cells. That's because the weight of the battery bars and solder equals the weight of the shrink-wrap, connector, end caps and wires. You'll discover that the additional capacity of Sanyo's 1700SCRC cells produces even more weight: a 6-cell LTO-style pack weighs 12.2 ounces—again, the same as an assembled pack made by the matcher. Swap red cells for black cells and you'll gain more than run time: your car or truck will also be ½ ounce heavier, and you'll have to remove

weight somewhere else.

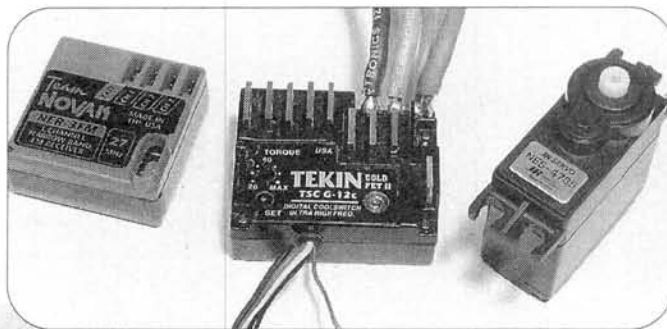
Don't worry too much about the weight of your electronics. My tests showed that almost all racing-type ESC/receiver combinations weighed roughly the same. The big difference came in the length of the wires used in the installation: longer wires simply weigh more, so it pays to plan the layout of your electronic components so that the wires will be as short as you can get them.

How about connectors? I weighed Deans, Race Prep, Litespeed, and Tamiya connectors. Their weights differ by a fraction of an ounce—not enough to make swapping brands worthwhile. I'd be more concerned about a connector's conductivity and resistance than about how much it weighs, although it's probably sensible to hard-wire your motor and use a single connector for the battery-to-ESC connection.

It's now difficult to shave much real weight off the chassis tub or chassis plate—especially



**Below:** check the weights of an assortment of radio gear and you'll find they're all much the same. My tests verified that the weights of most racing ESCs, servos and receivers all are pretty close.



PHOTOS BY DOUG MERTES AND WALTER SIDAS



## TIPPING THE SCALES

with the newer, graphite- or glass-filled plastics. You might be able to drop fractions of an ounce by using aftermarket shock towers; but most people swap shock towers for ones that they feel are stronger or offer more tuning potential, not because they're lighter.

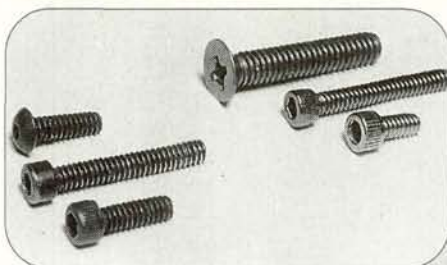
You might be able to save a little weight with a simple paint job that uses one or two thin coats instead of multiple thick coats and a box full of decals.

You can drop as much as a full ounce by using the new lightweight screws and nuts available from Trinity and Associated. Again, one screw doesn't make much difference, (the difference is so small that it must be measured in grains instead of fractions of an ounce), but if you replace a whole bag of 'em, the savings add up. Be aware, however, that many drivers use steel screws to secure the front and rear bulkheads and transmission case to the chassis because aluminum ones can snap under stress and cause a DNF.

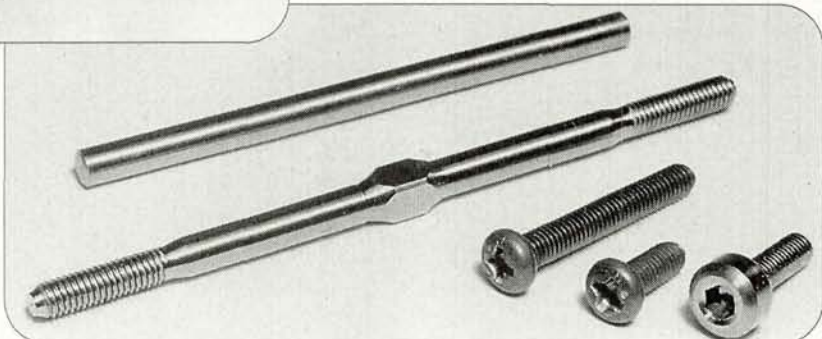
If you save enough sprung weight, you can re-balance your car or truck to suit different tracks by putting lead ballast (like the R/C airplane guys use), exactly where you want the weight to be. This brings the weight back up to the legal minimum for the class but allows you to move it up front for more steering, or to the rear for additional traction.

## ROTATION SUBTRACTION

Because all rotating mass in this category has to accelerate and decelerate when the car starts and stops, little changes here can have a pronounced effect. Do you really need the Hydra Drive that's mounted on your Losi or Associated car or truck? If the track you run on is smooth and hard, you could probably do without it and save almost an ounce. Check out the catalogues from manufacturers such as Hammad Ghuman, who specializes in lightweight



**Left: the screws on the left are steel; those on the right are aluminum. If you deck out your car with aluminum screws (except for critical high-stress areas such as the suspension components), you'll notice a significant weight reduction. Below: these days, you'll find titanium on almost all race cars in the form of screws, turnbuckles and hinge pins. Titanium is to R/C cars what Richard Simmons is to dieters ...!**



transmission parts; you'll find feather-weight tranny top shafts and diff gears. MIP have taken transmission-machining technology into an entirely new territory with their new, lightweight, outdrive halves; they're reputed to be as much as 1/2 ounce lighter than the stock pieces. Have you seen Robinson's new Absolute spur gears? In places, they're so thin that they're almost translucent, yet they're quieter and as reliable as any other spur gear on the market.

That's a real improvement! Trinity also makes new, light, graphite-filled composite spurs that are super-light.

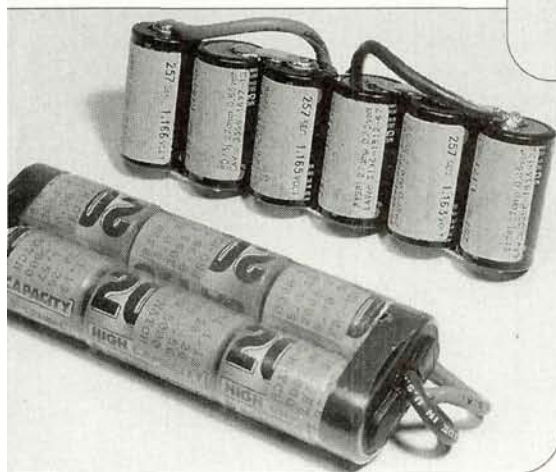
It's almost too easy to take a Dremel tool to some of these parts in an effort to drop a few fractions of an ounce, but be careful! Rotating mass is some of the most highly stressed material on your car or truck. Carve away a little too much, and you'll spend more time thrashing in the pits and replacing parts than putting in stick time on the track. You may also find that simply reducing weight here doesn't automatically make your vehicle faster. Consider Losi's two-part plastic drive shafts: introduced on their original JRX2 in 1988, these were seen as a marvel of lightweight engineering. Now we know that although they're lighter than the company's dogbones or universals, they're also a little less efficient. Lighter is not always better!

## REDUCTION RECAPITULATION

Let's face it; you can't legally race a car or truck that weighs less than the minimum mandated by your sanctioning body. Do a little research, however, and you'll find ways to reduce weight where you want to. A Pelouze scale accurately measures in 1/40-ounce increments to a maximum of 5 pounds and costs less than \$65 at most large office-supply stores. If you really want to check the weights of very small parts like screws and gears, pick up a grain scale like those used by hunters and marksmen who load their own ammunition. Most gun shops and hunting-supply catalogues offer them for less than \$35. If you think \$100 is too much of an investment for this kind of project, chip in with some of your racing buddies. Sooner or later, the other folks will wonder why you all go farther and faster than they do. When they ask about it, just tell them you've been on a diet! ■



**Left: the weights of different types of batteries, i.e., 1400SCRs and 2000SCRs vary. Above: tires are unsprung weight, but they're also rotating mass. Certain tire/wheel combos weigh more than others. Multiply the extra weight by four (four tires, right?), and you see how significant extra weight can be.**









# SNEAK PEEK

**W**HEN A PROTOTYPE of the new Team Associated\* GDS (Gas Dual Sport) arrived at our office, we knew right then that we had to let the cat out of the bag, so to speak, and tell the world about this awesome new product. Rather than wait for a full test of the GDS, we decided to give you a sneak peek at this new car so that you would have something to look forward to.

by George M. Gonzalez

## RC10GT CHASSIS?

The GDS is actually an RC10GT racing truck converted to Dual Sport proportions. To provide the same scale wheelbase as the electric DS, the GT's chassis had to be shortened considerably. Because the steering servo, throttle servo, 75cc fuel tank and engine mounts are all in their original GT locations, the GDS will accept most .12- to .15-size nitro engines. However, Associated recommends a .12-size engine or a sport .15 engine, as a racing-type .15 engine could be considered overkill for a 2WD chassis.

## GDS SUSPENSION

The GDS uses exactly the same front suspension as the electric DS. The rear suspension, however, has a few new parts that required Associated to do some additional tooling. Because the GT's laydown tranny was retained (the electric DS uses the original Stealth tranny from the RC10 buggy), a new fiberglass shock tower and molded swaybar mounts had to be manufactured. Other than that, all the other suspension pieces are the same as those on the electric DS.

# ASSOCIATED

# Nitro Dual Sport





### GDS TRANNY

As mentioned earlier, the GDS uses the same laydown Stealth tranny as the GT racing truck. You'll also notice that the excellent slipper-clutch unit and disk-brake setup have also been retained. The GT's super-low 2.6:1 final gear ratio has not been altered.

Some may say that Associated should have provided a higher final gear ratio that is better suited to the DS's small-diameter tires, but having a lower final gear ratio is actually an advantage. Here's why: the GT's diff is of a considerably larger diameter than that of the electric DS. Because of this, it doesn't rotate as quickly, nor is it subjected to as much torque. This means that you won't have to rebuild the diff as frequently. Also, the lower final gear ratio is better suited to the nitro engine's power band. We all know that glow engines need a little more time than electric motors to spool up and deliver the ponies. The lower drive ratio provides 25 to 30 percent more torque, and that helps eliminate most of

the lag that is associated with glow engines. If you still think that the gear ratio is too low, how does a top speed of 45mph sound? This is no joke, folks; the GDS hauls ass.

### DRIVING IMPRESSIONS

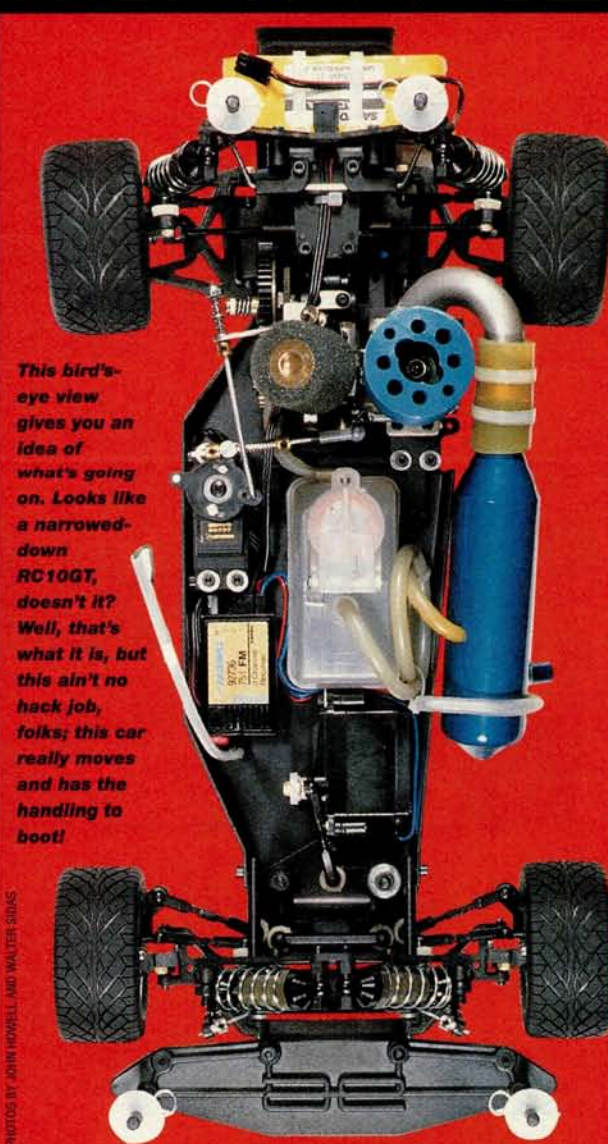
Team Associated's chief engineer, Cliff Lett, sent us a ready-to-run GDS so we'd be able to get some quality wheel time right away. We took the GDS to a brand-new, freshly paved parking lot and laid out a track with dozens of corner markers. One side of the track had an enormous straightaway and the other, a sweeper and several switch-back turns.

The GDS fired right up. Executive editor Frank Masi was the first one to drive the car, and he took the time to tune it for the cold Connecticut weather.

Here's how Frank summed up the GDS:

"Once we got the engine fired, I put the car down and slammed the throttle. That engine nearly burned the tires off the wheels! The speed of the GDS with a .12

# THE DS GOES GAS

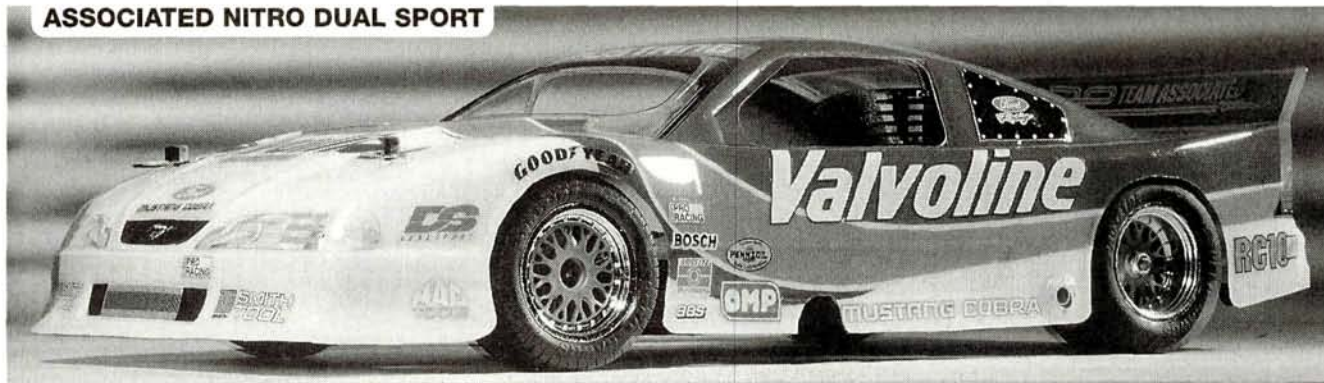


*This bird's-eye view gives you an idea of what's going on. Looks like a narrowed-down RC10GT, doesn't it? Well, that's what it is, but this ain't no hack job, folks; this car really moves and has the handling to boot!*

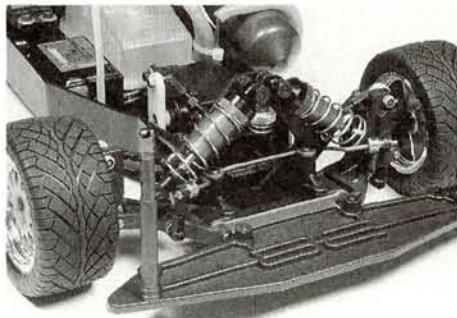
PHOTOS BY JOHN HOWELL AND WALTER SIDAS



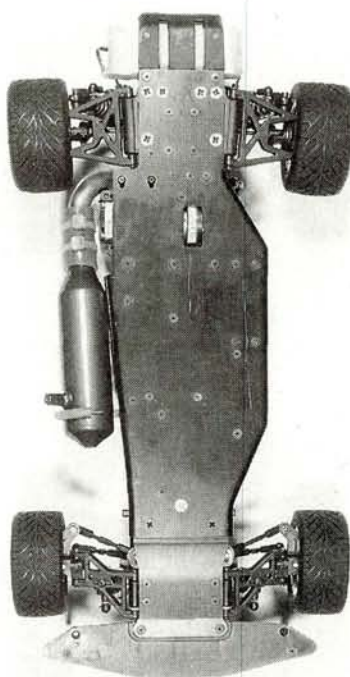
## ASSOCIATED NITRO DUAL SPORT



**If it weren't for the cutout windows, you would swear this is an ordinary DS. All five of Associated's DS bodies will fit on the GDS without any modification. These bodies include Trans Am Camaro, Trans Am Mustang, Mercedes and BMW touring cars and the Ford NASTRUCK.**



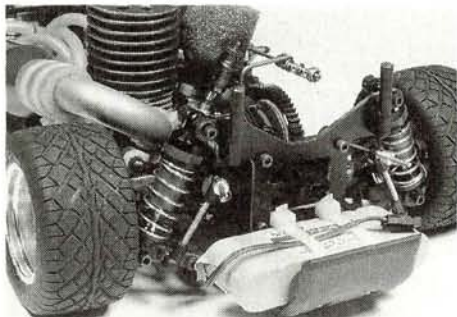
**The front end of the GDS is exactly the same as that of the electric DS. This particular prototype came equipped with silver springs, which are slightly more firm than the black springs that come with the electric DS.**



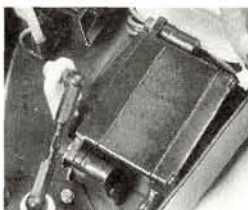
**Things look pretty familiar here. The RC10GT chassis lends itself well to an on-road application.**



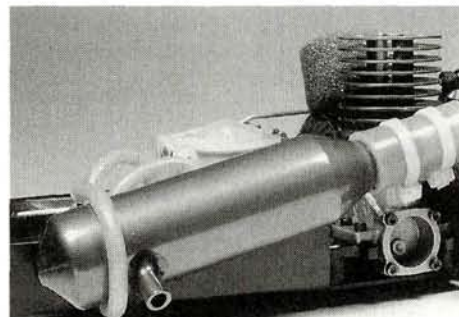
**The engine mounts are adjustable and allow you to change clutch bells to suit different track conditions. The throttle and brake linkages are all straightforward and easy to install. Any engine that fits the GT will fit the GDS.**



**As you can see, several things have changed back here. The RC10GT's lay-down tranny, slipper clutch and disk brake have all found their way onto the GDS. Silver springs are found back here, too.**



**Unlike in the electric version, the steering servo is mounted on the left side.**



**We're not sure whether the tuned pipe will remain in this position. A new exhaust header would allow it to be mounted lower.**

engine was phenomenal—easily on par with the fastest electric car we had with us that day.

"It took me a while to get used to driving the GDS, as it was almost too hairy to pilot at full speed. I think the combination of cold pavement and megahorsepower didn't mix well. In fact, Cliff at Associated believes that they might well have sent the wrong tires with the GDS prototype. We'll be trying stickier tires as soon as we can, and that should make the car more drivable. As it was, however, the GDS became more manageable as its tires heated and its driver

learned the ropes. Once you got used to the engine's power band, it was easier to stay with the electric-powered cars in the turns then set them up and blast past them on the straights!

"For most prospective GDS owners, I think a sport-type .12 engine will provide ample 'oomph.' More experienced drivers will need to make sure they have the right tires and that the chassis is set up correctly to run really 'sick' engines. Then they can lay down the power."

### AVAILABLE KITS

As it stands now, the GDS will be available

in various kits. Of course, there will be sport and racer versions (as with the electric DS), but don't be surprised if you see a kit that comes with everything you need, including the engine. As far as pricing is concerned, the GDS should sell for a little less than a comparably set up RC10GT kit. Expect to see the GDS hit the hobby shop shelves around the time this magazine hits the stands. The moment we get our hands on a production unit, we will publish a complete "Thrash Test," so stay tuned.

*\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.*



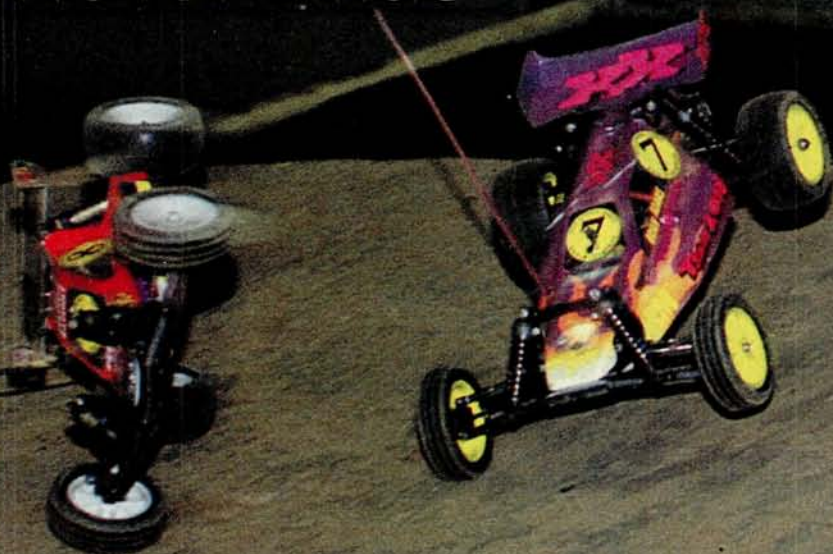






# Reedy Race

## The Birthday Party that Never Ends



When you talk with Brian Kinwald, make sure you have a point, or he may take measures to silence you.

by George M. Gonzalez

**E**VERY YEAR, hundreds of racers gather to celebrate veteran motor-builder Mike Reedy's birthday and to put on a show for all the partygoers. And what a show it is! How does getting all the best drivers from the four corners of the world together to race in a six-Main format with no qualifiers sound? If you answered "Pretty awesome," you're absolutely right.



Invitational finalists. Mark Pavidis (front center) captured the overall championship. Greg Hodapp (front left) finished second and Brian Kinwald (front right) grabbed third.





# f Champions



Left: Team Trinity/Team Losi's Brian Kinwald (right) bench races with Team Losi team manager Richard Trujillo. Here's what they were saying. "Hey, Richard, can you do something about that guy with the camera? He's such a pain in the %\$#@!" Far left: Eight-time world champion Masami Hirotsuka goes over his game plan with his dad/mechanic Masaaki Hirotsuka. I love those father/son teams.



Above: 4WD Open A-Main finalists. Left: 2WD Open A-Main finalists.

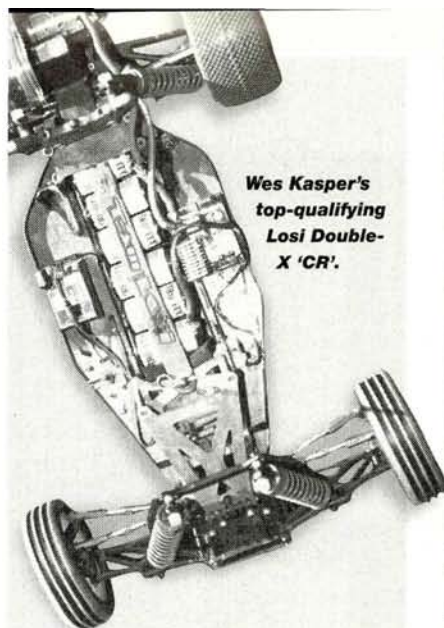


The ever-so-cool Derek Furutani wrenches on his ride. What happened to your long hair, Derek? I guess he's trying a new look.

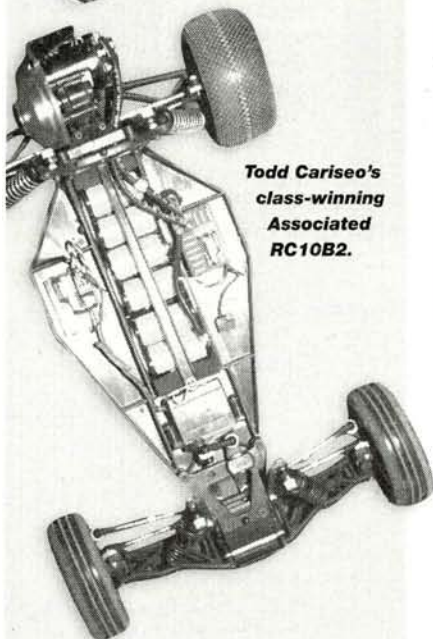
Right: 4WD Open champ Alex Guerrero effortlessly won the class with his new Losi XX-4. Far right: 2WD top qualifier Wes Kasper just couldn't hold it together during the Mains. He finished fourth after a bad start during the A-Main.







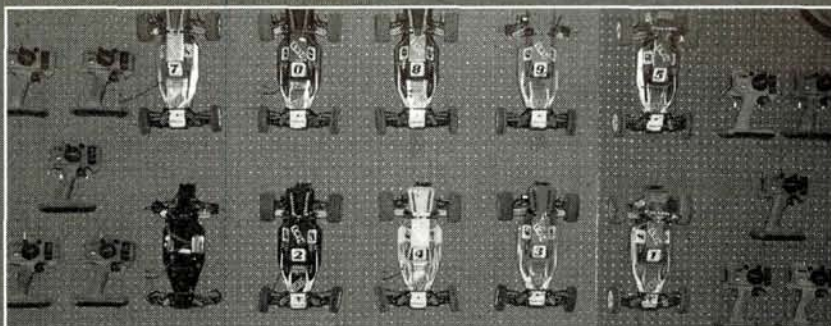
**Wes Kasper's  
top-qualifying  
Losi Double-  
X 'CR'.**



**Todd Cariseo's  
class-winning  
Associated  
RC10B2.**



**Alex Guerrero's  
top-qualifying  
and class-  
winning  
Losi XX-4.**



## R/C Rentals

Let's face it; for some people, getting started in R/C racing can be very expensive. Especially if a person isn't sure if he is going to have an aptitude for the hobby, and he doesn't want to spend hundreds of dollars to find out. Well, the folks over at M-N-M Raceway realize that this is a valid concern, and they have done something about it.

Enter R/C car rentals. M-N-M Raceway has a rental inventory that consists of 10 fully equipped Team Losi Double-X 'CR' off-road buggies. Each car is decked out with a Tekin Formula 10 ESC, a competition stock motor, 1700 racing pack and an Airtronics Rival 2P radio system. For extra durability, the cars are even equipped with titanium turnbuckles.

The rental rates are extremely reasonable. Instead of charging a considerable sum of money for an all-day pass, they rent the cars out by the battery pack. A single battery pack rents for around \$5, which is good for at least 10 minutes of running, or you can rent three packs for \$10, which will have you racing for nearly an hour (tweaking time included).

They also have a racing program that allows renters to compete with other drivers in an actual race—qualifiers and mains included. For \$20, you'll get a Double-X 'CR' with radio system, three practice battery packs, battery packs for the qualifiers and mains, your race-entry fee and a pit man. Wow! If this isn't a sweet deal, I don't know what is.

I wish that programs like this were around when I first got started. I didn't know any better, so my first car turned out to be an inferior racer. I ended up upgrading to a more race-ready car a few short weeks later, after I noticed my original car's shortcomings. Just think, now you can try out R/C with one of the best off-road cars available.

This year marked the 11th anniversary of the Reedy International Race of Champions. Gil Losi Jr., Cliff Lett and Jammin' Jay Halsey were household names to all us R/C'ers back in the days of the first Reedy Race, but today, names like Brian Kinwald, Masami Hirotsuka and Mark Pavidis come to mind when thinking of the world's best off-road drivers. Even though the names have changed over the years, the Reedy Race continues to attract the top R/C racers, and it has been known to launch a few new champions as well.

The 11th Annual Reedy Race was held at M-N-M Raceway in Corona, CA. Cosponsored by Novak Electronics and R/C Car Action, this year's action-packed event boasted many surprises.

### RIGOROUS RACING SCHEDULE

To keep in tune with previous Reedy races, there were three racing classes: 2WD Open, 4WD Open and Invitational. Open class competitions are open to the first 150 racers who sign up; however, many had to be turned away because the slots filled up quickly. Open class drivers in 2WD and 4WD compete in four strict rounds of qualifying, and the winners in each class are determined in a single Main event. The reason this class is so popular is because the winners are invited to race in the Invitational class at the following



**Greg Hodapp's consistent performance  
earned him second place overall in the  
Invitational Class.**

Reedy Race. These lucky (and talented) racers will share the drivers' stand with some of the fastest R/C racers on the planet.

Invitational class drivers are chosen to compete. This great honor is bestowed upon the most successful racers from the previous racing season, and guests are invited from Japan as well as from European countries. As mentioned earlier, the Invitational class racers compete in a six-Main format—without qualifiers—and they're awarded points for finishing positions (first = 1 point; second = 2; third = 3; etc.). In addition, the racer's worst finish is thrown out and only used in the event of a tie.



# REEDY RACE OF CHAMPIONS

## WINNERS

### 2WD Modified Open

| FIN. | QUAL. | DRIVER            | CHASSIS    | MOTOR      | BATTERY | ESC   | RADIO      | TIRES(F/R)    | PINION/SPUR |
|------|-------|-------------------|------------|------------|---------|-------|------------|---------------|-------------|
| 1    | 9     | Todd Cariseo      | Associated | Reedy      | Reedy   | Novak | Airtronics | Pro-Line      | 81/18       |
| 2    | 2     | Alex Guerrero     | Losi       | Peak Perf. | Orion   | Novak | Airtronics | Losi/Pro-Line | 84/20       |
| 3    | 10    | Matt Lee          | Losi       | Maxtec     | Maxtec  | Tekin | Airtronics | Pro-Line/Losi | 84/20       |
| 4    | 1     | Wes Kasper        | Losi       | Trinity    | Trinity | Tekin | —          | Losi/Pro-Line | 84/19       |
| 5    | 3     | Todd Hodge        | Losi       | Trinity    | Trinity | Novak | Airtronics | Losi/Pro-Line | 84/20       |
| 6    | 4     | Shawn Dassonville | Associated | Reedy      | Reedy   | LRP   | Airtronics | Pro-Line      | 84/18       |
| 7    | 8     | Bryce Beaver      | Associated | Reedy      | Reedy   | LRP   | —          | Pro-Line      | 84/18       |
| 8    | 6     | Mike Hoffpauir    | Losi       | Peak Perf. | Orion   | Novak | Futaba     | Losi          | 84/18       |
| 9    | 5     | Lloyd Dassonville | Associated | Reedy      | Reedy   | Novak | Airtronics | Pro-Line      | 85/19       |
| 10   | 7     | Dustin Biber      | Associated | Reedy      | Reedy   | Tekin | —          | Pro-Line      | 81/18       |

### 4WD Modified Open

| FIN. | QUAL. | DRIVER          | CHASSIS | MOTOR      | BATTERY | ESC   | RADIO      | TIRES(F/R)    | PINION/SPUR |
|------|-------|-----------------|---------|------------|---------|-------|------------|---------------|-------------|
| 1    | 1     | Alex Guerrero   | Losi    | Peak Perf. | Orion   | Novak | Airtronics | Losi/Pro-Line | 84/18       |
| 2    | 3     | Albert Guardado | Losi    | Peak Perf. | Orion   | Novak | —          | Losi/Pro-Line | 84/18       |
| 3    | 2     | Todd Hodge      | Losi    | Trinity    | Trinity | Novak | Airtronics | Losi          | 84/18       |
| 4    | 10    | Bryce Beaver    | Yokomo  | Reedy      | Reedy   | LRP   | —          | Pro-Line      | 87/17       |
| 5    | 5     | Travis Amezcua  | Yokomo  | Reedy      | Reedy   | LRP   | —          | Pro-Line      | 87/18       |
| 6    | 7     | Brent Wallace   | Yokomo  | Maxtec     | Maxtec  | Novak | Futaba     | Pro-Line      | 87/18       |
| 7    | 6     | John Scott      | Yokomo  | Reedy      | Reedy   | Tekin | —          | Pro-Line      | 87/18       |
| 8    | 8     | Matt Lee        | Yokomo  | Maxtec     | Maxtec  | Tekin | Airtronics | Losi          | 87/16       |
| 9    | 9     | Dustin Biber    | Yokomo  | Reedy      | Reedy   | Tekin | —          | Pro-Line      | 87/17       |
| 10   | 4     | Todd Cariseo    | Yokomo  | Reedy      | Reedy   | Novak | Airtronics | Pro-Line      | 87/17       |

### 2WD and 4WD Invitational

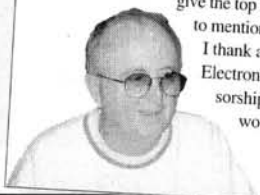
| FIN. | DRIVER         | CARS (2WD/4WD)                |
|------|----------------|-------------------------------|
| 1    | Mark Pavidis   | Associated B2/Yokomo YZ-10    |
| 2    | Greg Hodapp    | Losi Double-X 'CR/Losi XX-4   |
| 3    | Brian Kinwald  | Losi Double-X 'CR/Losi XX-4   |
| 4    | Scott Hughes   | Associated B2/Yokomo YZ-10    |
| 5    | Craig Drescher | Associated B2/Schumacher CAT  |
| 6    | Derek Furutani | Losi Double-X 'CR/Losi XX-4   |
| 7    | Atushi Hara    | Associated B2/Yokomo YZ-10    |
| 8    | Jukka Steenari | Schumacher Fireblade/CAT 2000 |
| 9    | Mark Francis   | Associated B2/Yokomo YZ-10    |
| 10   | Rick Hohwart   | Losi Double-X 'CR/Losi XX-4   |

### A Message from Mike Reedy

The competition in this event seems to get better and tighter every year. This year, the Invitational class saw a fantastic battle for the championship between Brian Kinwald, Mark Pavidis and Greg Hodapp. These three took it down to the wire with only 1 point separating them after 12 rounds.

Open class has a separate championship for 2WD and 4WD. Todd Cariseo, with his RC10B2, and Alex Guerrero, with Team Losi's new XX-4, won these championships.

Invitational class has no championship for 2WD and 4WD individually. The championship is determined by the combined points in each of these classes. This special event is designed to give the top racers in the world a chance to race heads up for two days. Not to mention, it gives us a chance to watch them battle it out as well. I thank all of the drivers who participated. I also thank Novak Electronics and R/C Car Action for their continued support and sponsorship of this and other events. Without them, races such as this would not be possible.



—Mike Reedy

## On The Web

The Internet has opened many new doors as far as marketing and promotion are concerned. With that, many R/C-related websites have been constructed that cover just about every segment of our hobby. For the most part, these websites receive hundreds of hits (inquiries) every week, which fortifies the Net as a valuable form of electronic media.

M-N-M Hobbies & Raceway is one of the first hobby stores/tracks to erect a website on the World Wide Web (<http://www.mnmhobbies.com>).

In it, you'll find information on upcoming events, race results, in-store promotions, information on their rental program and links to other useful R/C-related websites.

Next time you're online, make sure to check out the M-N-M site. You'll most certainly be impressed. I think as time goes on, more and more hobby stores will start using the Internet as a marketing tool and as a way to get new people interested in the hobby.

<http://www.mnmhobbies.com>

Here's the clincher: Invitational class drivers must complete six rounds in 2WD class and six rounds in 4WD class. When the 12 rounds are completed, the points are tallied and the driver with the lowest combined points is awarded the overall championship. As you can imagine, the pace is very fast and the racers are exhausted after the long weekend of continuous racing.

### OPEN CLASSES

• **Qualifying.** The competition in 2WD was extremely fierce. In fact, there was only a 4-second margin between the first and 10th qualifier. After four rounds, TQ'er Wes Kasper posted a 12/4:09.55 time, which was less than 1 second faster than Alex Guerrero's best time. At no point during the qualifiers could anyone have guessed the outcome; it was that close.

(Continued on page 191.)



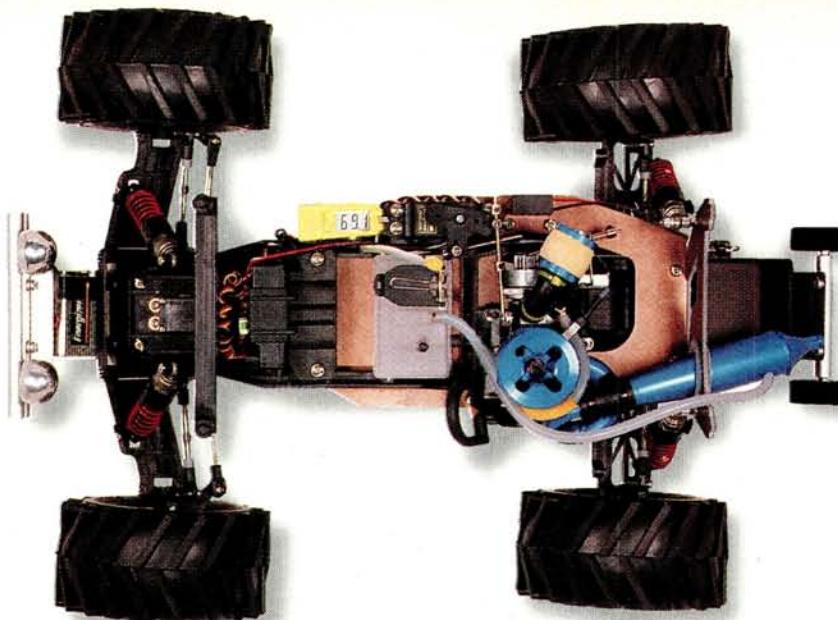
## 2ND LOOK

### Tuning and Modifying the

TRAXXAS

# Nitro Stampede

by George M. Gonzalez



**This overhead view allows you to see the big picture. Lots of upgrades; lots of blue-anodizing. Yes, one mean monster.**

**T**HE TRAXXAS\* Nitro Stampede is one extremely rugged monster truck. Right out of the box, it can wreak havoc on the most gnarly road conditions. Rocks, potholes, speed bumps, other R/C cars; the Nitro Stampede doesn't care; it will crush everything in its path. I was certain that I could make this truck even more formidable, but what I was really after was wheel-standing, stump-pulling torque and mind-boggling top speed. Could I make the Nitro Stampede tougher and faster without sacrificing bottom-end torque? Yes, my friends, it is possible, and I'll show you how it's done.



*Isn't it beautiful? Contributing author Greg Vogel was nice enough to paint the body for me. As you can see, Greg graduated with honors from Bich'n Bodies University. The HPI wheels, Pro-Line tires and ESP aluminum pieces really stand out. You should see what this truck looks like now. (The same, actually; I'm a little anal about R/C cleanliness.)*

#### MO' POWER

The stock TRX .12 engine is a competent performer, but it can be converted into a little screamer just by adding a tuned pipe, a large-bore carb and a tall heat-sink head. But I wanted more power than the little .12 is capable of putting out, even in hopped-up form. The answer: Traxxas' new TRX Pro .15 racing engine with pull-starter. It features radical porting, a tall heat-sink head, a high-performance carb and double O-ring seals throughout. The TRX Pro .15 is a high-quality, high-performance engine that will hold its own against the best.

I wanted my new engine to be a top performer, so I added a couple of bolt-on items. The first item was a tuned-exhaust system by MIP\*. MIP sells a purple-anodized tuned pipe called the 360 Stinger. Traxxas now offers the same pipe, manufactured by MIP, but the Traxxas pipe is blue-anodized—big deal, right?

Well, it is a big deal to me, because the TRX Pro .15 engine has a blue-anodized heat-sink head that matches the Stinger pipe nicely. If your heart is set on purple-anodizing, order the MIP version instead. Each kit comes with the tuned pipe, a 360-degree header, a special fiberglass shock tower, fuel line and instructions. The Traxxas instructions are far more comprehensive, and they provide step-by-step photos of the pipe installation on an actual Nitro Stampede.

To keep an eye on engine temperature, I installed one of MIP's reliable Temp Gauges. It's light and fuelproof, and it has a large digital display that can be seen even when the body is mounted on the chassis. I really like the fiberglass mount that comes with the unit; it's sturdy and makes mounting much easier.



My last upgrade was an OFNA\* blue-anodized air filter. It features sturdy aluminum construction and a removable foam element. The air filter fits snugly on a 45-degree rubber elbow that is installed on the carb with a nylon zip-tie. This unit will never fall off, it works great and looks really cool mounted on the engine.

I also made a couple of driveline improvements. The Nitro Stampede comes with a bearing-supported tranny, so to complete the set, all I had to do was replace the stock wheel bushings with eight, 5x11mm bearings. I also added a pair of MIP's massive Nitro Stampede CVDs. These are by far the beefiest drive shafts available for the Nitro Stampede. They work with less binding and are much more durable than the stock universal sliders. The units can also be rebuilt, and replacement parts are readily available at most hobby shops.

#### GROUND-CRUSHING REFINEMENTS

The next order of business was to improve the Nitro Stampede's already awesome suspension. I guess you can say that I'm one of those guys who can't leave well enough alone. Give me those big-bore bouncers, man! I pirated the shocks from my Traxxas SRT racing truck because it hasn't seen much racing in a while. Besides, I think the

(continued on page 198)

#### PARTS LIST

##### TRAXXAS

- 5x11 ball bearings (eight for the wheels)—part no. 4607.
- Hard-anodized big-bore shocks—2660 (long); 2662 (XXL).
- TRX Pro .15 racing engine w/pull-starter—4007.
- Traxxas/MIP high-performance tuned exhaust—4081.
- Soft Red off-road springs—4645 (2<sup>3</sup>/<sub>4</sub>-inch rears); 4640 (2-inch fronts).

##### MIP

- Traxxas Stampede CVDs—1143.
- On-board Temp Gauge—3610.

##### ESP

- Nitro Stampede wheelie bar w/skid-plate—ESP053.
- Stampede aluminum front bumper/skidplate w/lights—ESP051.

##### HPI

- Super Star MT chrome wheels—2175 (front, universal); 2185 (rear, universal).

##### PRO-LINE

- Masher monster truck tires—1041.

##### OFNA

- Blue-anodized aluminum air filter—10039.

##### HITEC

- HS-615MG high-torque steering servo.

##### FUTABA

- 3003 standard throttle servo.

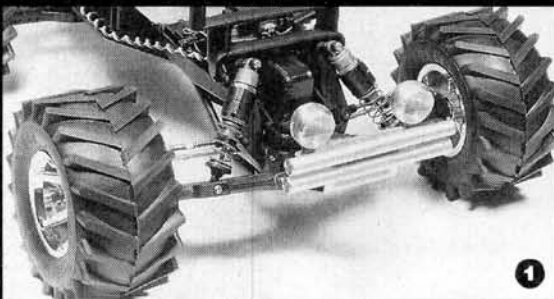
##### LUNSFORD

- 1<sup>7</sup>/<sub>8</sub>-inch Punisher titanium tie rods.

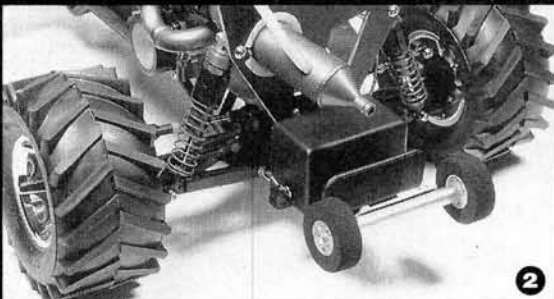
##### TRINITY

- Sanyo 5-cell, 600mAh receiver pack.
- 50WT pure-silicone shock fluid.

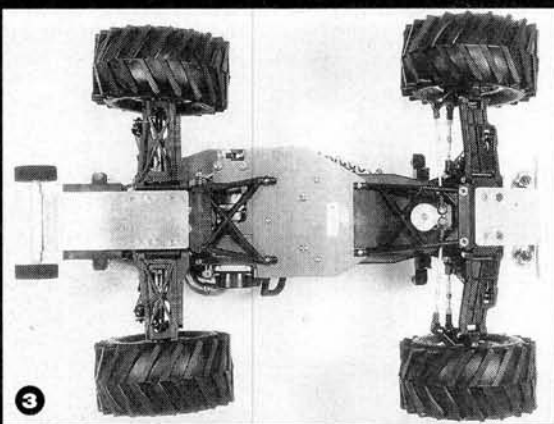
1. Traxxas hard-anodized, big-bore shocks with Red springs, Lunsford Punisher tie rods, HPI wheels and Pro-Line tires make up most of the front-end enhancements. The ESP aluminum bumper with running lights adds that concours touch. The lights also put out some serious candle power. ■ 2. In the back of the truck, you'll find the same upgrades as you'll see up front. The wheelie bar has seen lots of overtime during my tests. You can run the Nitro Stampede on two wheels all day long. When you want the front tires to return to the ground, let off the gas. Love that fiberglass shock tower and that big blue cigar. ■ 3. As you can see from this flip-side view, the ESP skidplates do a great job of protecting the chassis. A Hitec HS-615MG high-torque servo effortlessly maneuvers this big-wheel monster wherever I want.



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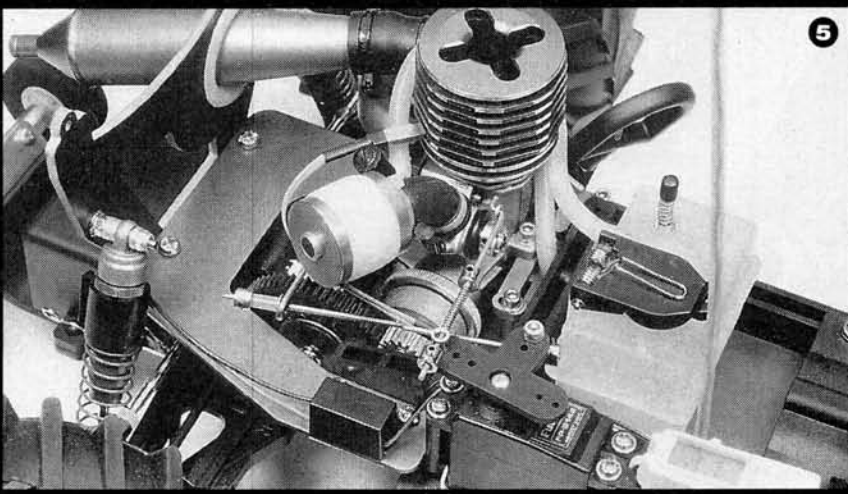
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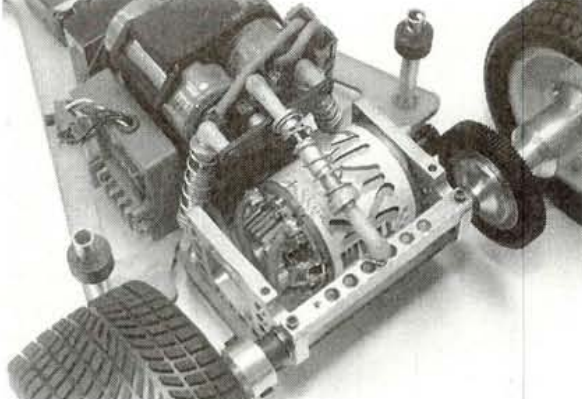
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■ 4. I replaced the Nitro Stampede's 4-cell battery cradle with a Trinity 5-cell, 600mAh hump pack. The receiver and servos now receive 6 volts of power instead of 4.8 volts. The extra voltage adds speed and torque to the servos and provides more run time than the 4-cell setup. ■ 5. The Traxxas TRX Pro .15 engine is a bit on the wild side. If you're looking for silly horsepower, pick up one of these babies. The MIP tuned pipe boosts performance and allows the engine to breathe better. The OFNA blue-anodized air filter is an excellent choice. Never run a glow-powered vehicle without an air filter. I don't know how I ever got along without a temperature gauge; the MIP unit is easy to install and works great.

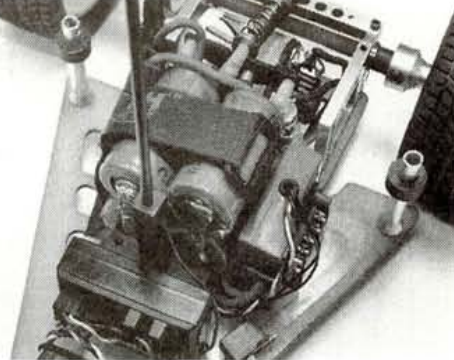


The rear motor pod is an interesting combination of a Bolink bulkhead and motor-mount plate and a crossbar with three Hyperdrive shocks. Power comes from Trinity's Team Kinwald 12-turn double modified

motor and is transferred to the pavement via a BME fiberglass axle. Other racers who compete in this class use a variation of this tripod-design suspension. Kimbrough 64-pitch gears and TRC rear hubs were used as well.



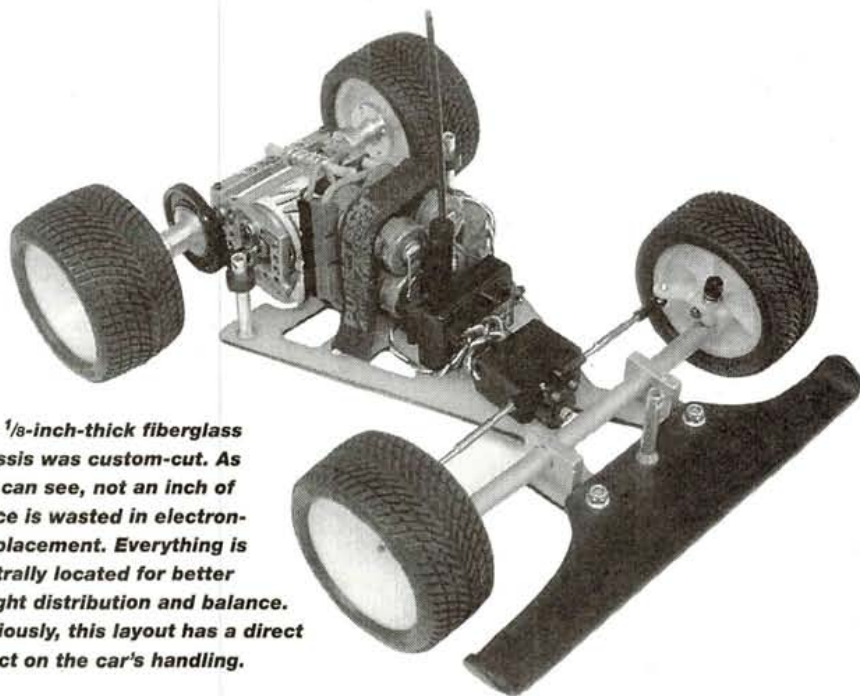
The batteries are literally piled in the middle of the chassis. A Pure-Tech\* battery strap keeps the 1400 SCR cells in place. Only 4 cells are allowed in this class. This not only cuts down on weight, but it's also about all there's room for!



# Car



The 1/8-inch-thick fiberglass chassis was custom-cut. As you can see, not an inch of space is wasted in electronics placement. Everything is centrally located for better weight distribution and balance. Obviously, this layout has a direct effect on the car's handling.



Pro-Line's Road Hawk III tires with Pro-Line rims up front and Road Hawk I's out back. Standard bearings can be used with these rims. Note the directional arrow on the tires' sidewalls. This indicates the direction the tire rotates in to ensure that the rubber is mounted correctly on the vehicle. Foam inserts are also included with the new street meats.

## specifications

### Dimensions

- Wheelbase: 7 1/2 in.
- Width: 9 1/4 in.
- Length: 12 1/2 in.
- Height: 7 1/2 in.

Chassis—pan-car style, 1/8-inch fiberglass.

Front suspension—Hyperdrive\* beam with Associated\* 10T steering blocks, Tecnacraft\* tie rods.

Rear suspension—Bolink motor pod with Hyperdrive shocks, BME\* axle/TRC\* hubs.

Motor—Trinity\* Team Kinwald 12T modified.

Batteries—4-cell Sanyo 1400 SCR.

Gears—Kimbrough\* 64-pitch spur and pinion.

Wheels—Pro-Line rims front and back.

Tires—Pro-Line Road Hawk III AC-63 (front), Pro-Line Road Hawk I AC-61 (rear).

Body—Bolink Sprint with wing and Autographics "Family Channel" decals.

Electronics—Futaba\* Magnum Junior transmitter, FP-R112JE receiver and S132H miniservo; Tekin\* 410S ESC.

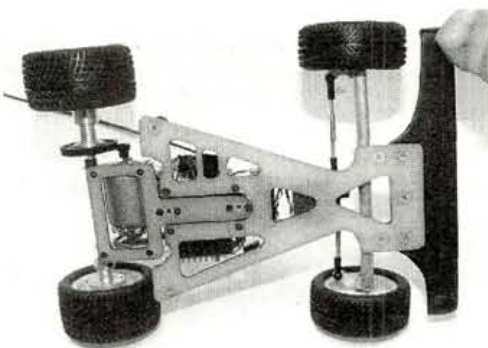
Previously, I had been unable to mount a set of Haws on my pan car because of a body/tire clearance problem. With an open-wheel sprint car, I'd have no trouble. Kim was willing to let me borrow his ride for the project I had in mind. I love it when a plan comes together!

The fiberglass chassis on the car was originally purpose-built for carpet oval racing. The oval cars simulate their full-scale counterparts quite well. With a wheelbase of 7 1/2 inches, they are almost as wide as they are long. And their wheel offset is outrageous. This design really helps in the cornering department. It's almost impossible to flip these suckers! The standard setup is 4 cells and a modified motor, and they are run in a 4-minute race program. Because 4 cells is the limit in this class, gearing can be crucial, but for most, finishing the 4-minute race is no sweat. Believe me, these sprinters are fast!

I chose Bolink's\* 1/12-scale Sprint body (part no. BL2006). The shell includes a large spoiler and a small one for plenty of downforce. Large side dams made from a sheet of .020 polycarbonate specially made for side dams are held on with strips of servo tape. I was feeling rather patriotic, so I sprayed on the "Family Channel paint scheme" (with a bit of a twist) and I made the paint lines nice and sharp by using Dahm's\* Pro Mask kit. After I had said the Pledge of Allegiance, I complemented the paint job with Autographics\* 1/24- and 1/40-scale decals.



## MINI SPRINT



The rear T-plate and the bottom motor pod plate are a single piece of fiberglass that was uniquely designed to be flush with the chassis. All screw holes were countersunk for a smooth, clean surface.

Foam tires are run at my local track, but to make this vehicle "streetable," I wanted to add some real rubber—hence the use of the aforementioned Pro-Lines. This would allow me to drive the car on the street or parking lot between trips to the carpet track. I mounted Road Hawk III tires (1063) up front on Pro-Line rims (1557). Out back, I used Road Hawk Is (1061) mounted on no. 2567 rims. Both of the Road Hawk series tires include foam inserts.



This is how the project started. Yes, the "Silver Bullet" was quick in its original form, but with a little bit of work, it has become a real screamer!

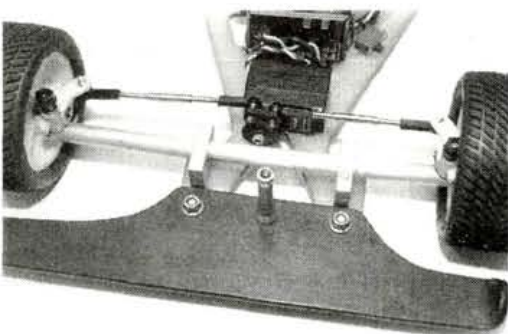
### PERFORMANCE

With fresh meats mounted, I set out for some test runs. Despite its short wheel-base, the car's handling was great. The tire combo proved to be excellent for blasting around on unprepared surfaces. The street in front of my house was the first test area

for the new rubber. Note: it's very dangerous to drive your R/C vehicle in the street, and I don't recommend it, but I couldn't resist taking a few hot laps! Even with the modified motor, the tires gripped well.

This is a unique car, and it's loads of fun to drive. If you have a box full of spare parts lying around, you may want to start your own scratch-built project. Who knows, maybe I'll start a whole new race class at the weekend parking lot scene!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.



The front suspension is based on this 3/8-inch aluminum beam from a Hyperdrive pan car. No camber adjustment is possible. Caster adjustments are made by rotating the beam forward or backward. TecnaCraft tie rods link the steering system to a small Kimbrough servo-saver. Steering torque is supplied by a Futaba S132H servo; it's small but mighty. The front bumper is fashioned out of a piece of ABS bumper plastic. Associated 10T steering blocks are used with stock springs mounted on the pin. The springs can be tweaked or changed easily by turning the nylon nut.

## XPRESS WINS 4 '96 NATIONAL CHAMPIONSHIPS!



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New ROAR  
National Champion  
Ken Gendling

GTO 962K  
4WD MINI CAR

FEATURING: Full Carbon Fiber Chassis, Shock Towers & Top Plate  
• 4-Wheel Independent Suspension with Oil-Filled Shocks • Belt Drive • Full (14) Ball Bearings • U-joints • Front & Rear Ball Diffs, and more!

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**NEW!** MINI BMW SEDAN BODY  
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'96 NORRCA ONROAD NATS:  
Jim Kao WINNER  
• 4WD Sportsman Sedan Mod.  
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1, 2, 3, 4, 5... X-Press SWEEP!  
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Including Tim Bump, A-Main Winner

FEATURING: 4WD, Fully-Independent Suspension • Full Carbon-Fiber Chassis, Top Plate & Shock Towers • Oil-Filled Shocks • Universal Joints • Front & Rear Ball Diffs • Adjustable Front Caster • Aluminum Motor Mount • Full Ball Bearings and MORE!



4WD  
XPRESS



# Paint without Spray Cans

Great finishes the old-fashioned way—by brush! by Rick Eyrich

**D**O ANY of us have all the space we need for our R/C activities? I doubt it. What's more, the area we do have is usually close to our home's main living space, so if we want to spray-paint, we have to do it outdoors. Who wants overspray on the furniture? I have a better idea that you might want to consider.

Why not hand-paint those polycarbonate shells? To replicate the Williams FW18 Formula 1 scheme on the Tamiya\* model shown here, I used Tamiya's bottled paints, several styles of high-grade brushes and masking tape in three widths (6, 10 and 18mm). The Tamiya paints are suitable for polycarbonate/Lexan and have very little odor, so no one will object to their use indoors.

## PREPARATION

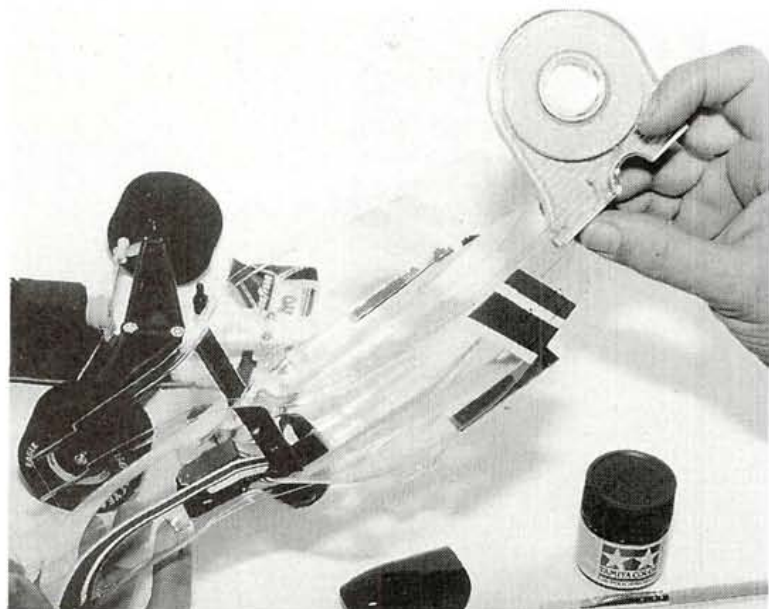
Before you brush the colors onto the clear body shell, you must follow the usual body-prep procedures—just as you would if you planned to air-spray. First, clean the inside of the shell with denatured alcohol, and follow that with soap and water. Finally dry the body with a paper towel (less lint).

Use regular masking tape to cover the body openings/edges and use striping tape (such as the special Tamiya tape) to lay out your paint-separation lines (between the different colors). The graphics design on the Williams car allows you to apply the side-pod decals first—before you start to paint.

## APPLICATION

My painting technique for this F1 body wasn't too unlike the one house painters use on interior walls! Use a wide, fine-bristle brush for the large open sections and a fine-tip brush for the fine line/detail paintwork. Before you start to paint, dampen the brush with water. The Tamiya colors are thick, and a moist (but not wet) brush ensures that you get a smoother coating with less effort.

**Above: the Tamiya Williams-Renault ready to paint. Yes, I did the driver figure first. Right: the Tamiya masking tape is excellent—no paint bleeding and no leftover residue. Most important, there was no overspray because I didn't use spray paint.**





## S-L-X Denatured Alcohol

For use on plastic, metal, and more.  
Alcohol Denatured  
Tamiya

Use your car's assembly guide—or even the box it came in—to determine the color-separation lines. Then use masking tape and/or body graphics to map out the scheme you want.

When you're short of work space, hand-brushing instead of spray-painting may be the way to go. Try Tamiya's line of paints and supplies, and follow the directions that come with the kit's decals.

To do a good job, you'll need brushes in at least two sizes—a wide one for the larger areas and a fine one for detail work. Stick with fine-bristle brushes; they're less likely to leave marks in the paint.

## Principles to follow

- Do small areas.
- Don't go back over an area after you've coated it.
- Avoid applying the paint in heavy layers. At the end, you should have a solid color, but applying too much paint just makes your car body heavier, not prettier.

Paint the body in small sections, and avoid going back over the same areas. When the paint has cured thoroughly, apply a second coat in the same way.

Excess paint means more weight and less speed. You want the body to have a rich, deep color—that's all.

Right: Tamiya paints are fairly thick, so moisten the brush slightly with water before you start to paint. The paint will go on more smoothly. Be sure you dampen the bristles only slightly because a brush that's too wet can dissolve the paint that's already on the shell.

Left: on a two-color paint scheme, you'll have only a couple of breaks in the color lines to worry about. I applied the Williams F1's outside decals and then used the white and blue Tamiya polycarbonate paints on the inside. The decals hide the color overlap—neat!

## WASH UP AND WRAP UP

All you need to clean your brushes after using Tamiya's polycarbonate paints are regular soap and water—period. Be sure to get all the paint out of the bristles so you won't contaminate the next color you apply. Finally, clean and smooth out the wet bristles to straighten them and ensure the brush will be perfect when you want to use it again. This method will keep your brushes in top shape for a long time.

Remove the masking when the paint has had enough time to cure thoroughly, then stand back and admire your artwork!

If the shell is nicked or scratched when you run your car, use one of Tamiya's matching polycarbonate pens for a paint touch-up.

So don't let space limitations prevent you from being an artist; use a brush to transform those bodies. Tamiya's paints are almost odorless, they stick like glue to the polycarbonate and can be cleaned up with simple soap and water. Of course, you can spray them on with an airbrush, too, but who has the room for that?!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201. ■



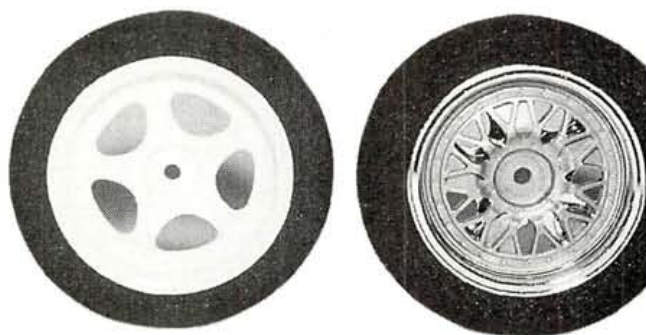
## G-FORCE RACING

### Foam Tires for Touring Wheels

Until now, sedan racers were forced to use ill-fitting after-market wheels with foam tires for carpet surfaces. G-Force now offers foams that fit directly onto existing wheels. The designed-to-fit foams will help your wheels retain the same offset, diameter, width and looks for better racing performance. They are available for a variety of touring cars.

**Part nos.—1024 to 1034; price—\$9.95/pair.**

G-Force Racing, 1661 Denison St., P.O. Box 76614, Markham, Ontario, Canada L3R 0N5; (905) 477-1338.



## TRINITY

### Long and Natural "T" Bars for Revolver 22.2j

These new fiberglass "T"-bars have better memory and don't get fatigued as quickly to provide better and more consistent handling from charge to charge. They are available in 90-degree layup in two different thicknesses for 4- and 6-cell racing.

**Part nos. and price—RE1028-63 (.063 for 4-cell); RE1028-74 (.074 for 6-cell), \$6.**

Trinity Products, 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.



## CUTTING EDGE ENTERPRISES

### Powerport 149 Hand-Portable Power

This multi-use power supply packs a punch in a highly portable, manageable unit. A 12V, 9mAh gel-cell battery provides all the power you'll need to recharge 7.2V and 9.6V Ni-Cd battery packs and to run and charge many devices (including laptop computers, test equipment,

soldering irons, hot-glue guns and emergency lighting); it can be charged from a wall socket or cigarette-lighter outlet. A padded bag with detachable accessory pouches and flexible solar panels are also available as options.

**Part nos. and prices—140W (9A), \$159.95; 140W (7A), \$136.95; 50W, \$114.95 (plus S&H).**

Cutting Edge Enterprises, 1695 River St., Santa Cruz, CA 95060; (408) 429-5384; fax (408) 426-0115.



## KYOSHO

### Porsche 911-GT1 SuperTen GP 4WD

Like the other SuperTen series cars, this detailed replica of the 1996 Le Mans cham-



pion features a larger and more powerful engine (Kyosho's GT-15 with recoil starter) to boost excitement and realism; a narrower, longer chassis (20x9 inches) to add to a scale profile; a low weight (4.14 pounds) to assist speed; and a sturdy wheelbase for better planted power on the racetrack. Authentic decals included with the kit add realism.

**Part no.—KYOC0349; price—\$499.99.**

Kyosho; distributed by Great Planes Model Distributors, 2904 Research Rd., Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-0008.



## AMERICA'S HOBBY DISTRIBUTORS

### Speed Check Personal Sport Radar

This hand-held, portable, compact radar will enable you to measure your car or truck's speed track-side—without having to call the "men in blue."

**Part no.—AHC244000; price—\$159.95.**

America's Hobby Center, P.O. Box 829, North Bergen, NJ 07047-0829; (800) 989-7950.

## PRO-LINE

### Bow-Tie Truck and Buggy Tire

These next-generation square-spike tires were designed to cover anything from the roughest terrain to medium rough surfaces. They have a new low profile and round carcass design, internally and externally reinforced sidewalls and center interior carcass for consistent tire-patch support. They are available with either M2 or M3 tire compounds and come in both 2.2-inch truck and buggy sizes.

**Part nos. and prices—8196M2 (truck with M2), \$17.95; 8196M3 (truck with M3), \$17.95; 8186M2 (buggy with M2), \$12.50; 8186M3 (buggy with M3), \$12.50.**

Pro-Line Racing, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.







B-B PRODUCTS

## Stick-It Tire Traction and Tire Cleaner

Stick-It tire-traction compound and tire cleaner were designed to produce the best results with the least wear on your tires. Neither contains wintergreen oils or thinners, which can melt glue and cause tire separation. The length of time the tire traction is left on will determine how much traction the tire will have when it meets the track. The cleaner removes dirt and tire dust from foam tires so you can get better race results next time around.

**Part nos. and prices—Stick-It tire traction, \$5.95; Stick-It tire cleaner, \$3.95.**

B-B Products, 48835 N. 25th Ave., Phoenix, AZ 85027; (602) 465-7831; fax (602) 465-7077.

XIPP INC.

## Zapper

This processing system enhances your Ni-Cd cells' voltage output—up to 2.6 percent—and lowers the internal resistance—by as much as -6.4 percent. Great for stock and modified racing, this system helps you get the maximum punch from your new or used battery packs and is available with an adapter so you are able to process either single cells or packed cells.

**Part nos. and prices—50001 (for single and loose packs), \$399; 50002 (with adapter for battery packs), \$499.**

Xipp Inc., 4201 Church Rd., Ste. 265, Mt. Laurel, NJ 08054; (609) 778-9477.



TOWER HOBBIES

## System 3000 2TW 2-Channel Radio

This professional-quality radio offers a textured grip and cushioned wheel for added comfort while driving. In addition to basic steering and throttle control, the 3000 offers proportional trims and throttle ATL and ATV for greater precision. A receiver featuring BEC, an 8-cell battery holder, a 4-cell battery box and a Tower Hobbies standard servo with J-style connector are also included. The System 3000 is available in 27 and 75MHz.

**Part nos. and prices—TOWJ20 (with one servo), \$44.99; ZZ8158 (with two servos), \$52.99.**

Tower Hobbies, P.O. Box 778, Champaign, IL 61824; (800) 637-6050.

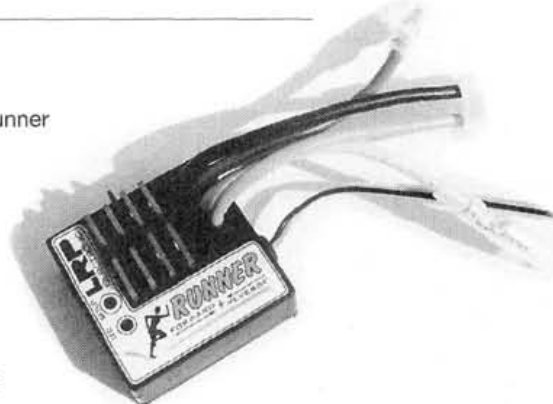
LRP

## Runner Digital Speed Control

One of four new speed controls in the LRP family, the Runner uses new digital technology for cooler and smoother running. It includes a digital current limiter, adjustable drag brakes—in addition to normal adjustable brakes—and hyper BEC. It also features automatic full power digital starts, more power with longer run times, maximum interference suppression and a simple one-button setup.

**Part no.—LRP8304; price \$79.95.**

LRP; distributed by Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626; (714) 850-9342; fax (714) 850-1744.



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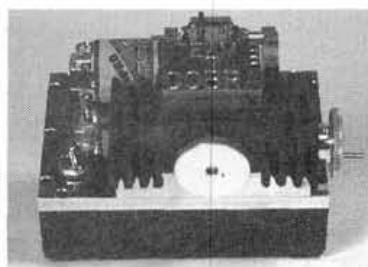
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### Nor-Cal Mini Speedway

During the first season of competition at the Indoor Hockey Arena, in Woodland, CA, owners Steve and Charlotte Van Atta were approached by a group of R/C enthusiasts who were interested in running their 1/10-scale electric vehicles on the arena's smooth, flat surface. Within five minutes of watching the mini cars glide across the asphalt, Steve was interested in using the facility for R/C

as well as roller hockey. The arena was initially too smooth for good R/C performance, so 7,000 square feet of carpet was installed and piping was laid down. The result: the Nor-Cal Mini Speedway—a 250-foot oval track and a 355-foot roadcourse with an Autoscore program that helps track the race results. The first race brought 46 entrants, including quite a few "amateurs" who were trying their hands at "this R/C stuff!" By the second season, events were pulling in close to 70 racers, and promotional activities were on the rise. The group shown here gathered to compete for turkeys, trophies and other fun prizes on Thanksgiving Day. Steve tells us that the surface was "flawless," the lap-counting system totally automatic ... and everyone had a great time.



### 8th Annual Indiana State Off-Road Championships

One hundred and thirty-one racers gathered in Lynn, IN, at R/C World for a perfect weekend of off-road racing at the Indiana State Championships. Four classes—stock and modified buggy and truck—were contested, and there were six Mains for each final. Everyone agreed it was a great weekend where everyone had a chance to do their best. Pictured here are the A-Main 2WD winners.

#### 2WD Stock A-Main

1. Chris Bing
2. Dean Karns
3. Chad Buffalo

#### Modified Buggy A-Main

1. Brian Dunbar
2. Chris Bing
3. Chad Buffalo

#### Stock Truck A-Main

1. Allen Horne
2. Tony Crowell
3. Tony Hopper

#### Modified Truck A-Main

1. Allen Horne
2. Chuck Berg
3. Scott Burns



### Serpent Grand Finals

Winners from Serpent's regional races—run throughout the year around the world—gathered in Lisse, the Netherlands, for the Serpent Impact Challenge Grand Finals. They battled it out for world championship in Sportsman, Expert, Elite, Team and One-on-One classes with 4,500 spectators on hand throughout the weekend! Everyone agreed that close qualifying led to exciting racing in the finals and unique events—like the Chase Race and Nation's Cup—kept the crowd's attention throughout the weekend.



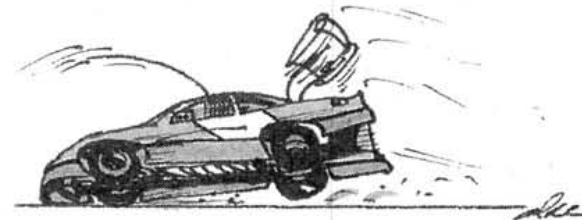
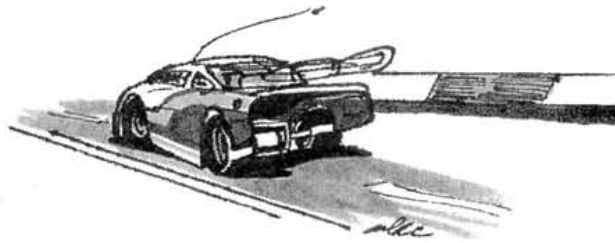
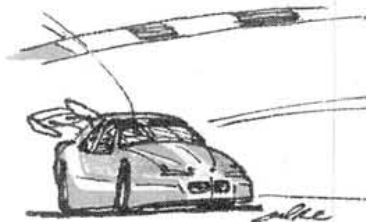
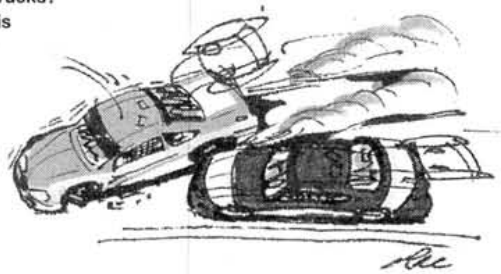
## Burien Toyota of Seattle

It all started when Burien Toyota of Seattle, WA, ordered two Tamiya Prerunners for their showroom to see whether they would sell. Well, the dealership's employees snatched up 30 of the Prerunners that Christmas, and Burien knew they'd hit on something. Soon afterward, a group of them gathered at the service department and put on their first race. Well, since then, the program has taken off. Races are run every week-end, and there's an end-of-the-year finals in late December. With a canopied parking area and indoor pit, races are held regardless of weather. A full line of Tamiya cars and trucks? Well, they have 'em, plus replacement parts and hop-up options. This group of racers gathered with their rides at the 1996 year-end race.



## "The Track"

This "Dual" Sporting Life group photo was taken at the inaugural Dual Sport points series race at The Track in Gaithersburg, MD. Track owner Mimi Wong handed out awards and pizza to entrants and winners. Races in all classes are offered regularly: DS series races on Wednesday nights, F1 on Thursdays and 4WD and 1/12 scale on Sundays.



## Virtually R/C Racing

These great action sketches came to us from Michael Cummings of King, NC; he's a fan of R/C in the most unconventional way. Michael doesn't race (heck, he doesn't even own a car), but he sits in the pits during races and captures his "virtual experiences" in great drawings like these. For a look at Michael's work in color, turn to Chris's "Back Lot"!

## R.I.S. Parkway

Tony Starling of North Carolina pointed out that we neglected the "mid-South" in our "Up and Down the East Coast" "Grassroots" in February 1997. He wrote to tell us about the track he built for his friends; it turned into a racing center that draws enthusiasts from five states. The classes that run are stock (ROAR specifications) and modified buggies and trucks. The track (see right) is 750 feet of clay/sand with eight high-banked turns, drop-offs, a hill climb, tabletop, doubles and much more.





## REEDY RACE OF CHAMPIONS

(Continued from 136.)

4WD, on the other hand, was dominated by one driver—Alex Guerrero. Todd Hodge was the only driver to give Guerrero a run for his money and the only other driver to post a 13-lap run, but his best time was still more than 4 seconds slower than Guerrero's 13/4:15.54 top-qualifying run. Keep an eye on Alex Guerrero; this guy is a rising star and has the potential to be one of the best.

• **2WD A-Main.** Five Associated B2s and five Losi Double-X 'CR's comprised the A-Main grid. Top qualifier Wes Kasper used the pole position to his advantage and stormed in front with a cloud of dirt following close behind. After the dirt clouds had cleared, Todd Cariseo's B2 and Alex Guerrero's Double-X 'CR' appeared directly on the tail of Kasper's Double-X 'CR.' Kasper's lead was short-lived, however; at the end of the first turn, Cariseo managed to bully his way in front of Kasper. Kasper was bumped to second, but Guerrero wasn't comfortable sitting in third for very long.

As it turned out, Kasper's car ended up on its lid while negotiating the intricate infield section, and this gave Guerrero plenty of time to sneak by and claim second. As the final seconds of the race counted down, Kasper lost yet another position and found himself in fourth behind Shawn Dassonville. Matt Lee, who was in the flanking position throughout the race, made his way up through the field and found himself in third, just behind Guerrero.

After the buzzer sounded, it was a mad dash to the finish. The results: Cariseo first, Guerrero second and Lee third. Wes Kasper had to settle for fourth. Better luck next time, Wes. Looks like Todd Cariseo will be asked to compete in the Invitational class at the next Reedy Race, so he'd better start practicing!

• **4WD A-Main.** Seven Yokomo YZ-10s and three Losi XX-4s found their way to the A-Main grid. This time, it was Alex Guerrero who was sitting on the pole. He was clearly on a mission, because he stormed out in front and never looked back—not even to check out the trophy girl when she made her grand entrance; this guy's a rock!

This was the first time I got a close look at the XX-4 in action, and I have to tell you, this car steers, jumps and accelerates like a 2WD buggy, but on the corners is where the 4WD advantage comes into play. In a few short years, I think that 4WD off-road racing will be one of the most popular racing classes.

Guerrero had won the race early on, but a war for second was waged by Albert Guardado and Todd Hodge. Although Guardado and Hodge battled it out to the bitter end, their positions never changed, and they ended up finishing as they started.

It looks as if Alex Guerrero will be sharing dirt with the Invitational class drivers at the next event. I told you to keep an eye on this guy! So how did the Losi XX-4 fare? The three XX-4s finished first, second and third. Looks like a sweep to me!

### INVITATIONAL CLASS

As I mentioned earlier, the Invitational class drivers competed in a 12-Main grudge match without qualifiers. On Saturday, six Mains were contested in 2WD class. This is really a confusing race, and at first, I had no idea what was going on. But I knew one thing for sure: Team Trinity/Team Losi's Brian Kinwald was the man to beat. Brian ended up with four firsts, one second and one third (6 points after the third was eliminated) to win the 2WD Invitational. Team Associated's Mark Pavidis had three firsts, two seconds and one sixth, for 7 points and second overall. Team Losi's Derek Furutani had 9 points to secure third overall.

On Sunday, hundreds of spectators gathered to watch the grand finale. Six rounds of 4WD class racing would determine the winner of the Invitational class. Team Trinity/Team Losi's Greg Hodapp finished with an amazing five firsts and one fourth—totaling 5 points—to win the 4WD Invitational. Mark Pavidis had three firsts, two seconds and one sixth finish, for 7 points and second overall. European 4WD Champ Jukka Steenari had 8 points to place third.

After the last round in the Invitational, the officials locked themselves in a room and started counting. This year, the counting went smoothly and the results were posted without hesitation. "The results?" you ask. Team Associated's Mark Pavidis drove the most consistently, and this earned him 14 points and the overall championship. Team Trinity/Team Losi's Greg Hodapp and Brian Kinwald tied with 15 points, but after their throw-out rounds had been factored in, Hodapp claimed second. Of course, Kinwald ended up third.

### FINAL THOUGHTS

The 11th Annual Reedy International Race of Champions went without a glitch, thanks to the professional staff at M-N-M Raceway. R/C Car Action congratulates Mark Pavidis, Alex Guerrero and Todd Cariseo for their achievements as well as their spectacular performances. I would like to personally thank the following people: track owner Joe Stanovich, tech/coordinator Dick Smolik, counter sales personnel Bill Baltran and Ronda Skelton, announcer Daniel Adams and the entire track crew, including Johnny "B." M-N-M Raceway is a first-class organization, and the staff are true racing enthusiasts. Of course, we here at R/C Car Action also thank Novak Electronics for its generous sponsorship and wish Mike Reedy a belated happy birthday. ■

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## HPI NITRO RS4

(Continued from page 69.)

The car's most impressive performance traits, however, involve the steering, braking and throttle control. The Nitro RS4 has more steering than any racer would ever want; in fact, I dialed out most of it on my radio, and the car could still negotiate hairpin turns at speed. Acceleration was smooth and consistent, and the brakes are simply exquisite! Overall, I'm extremely impressed with the Nitro RS4.

### FINAL THOUGHTS

My feelings about the HPI Nitro RS4 are entirely positive. It accelerates smoothly, and its braking system surprised me; I had so much control that it was almost impossible to get the car out of shape. I can't wait to install a tuned pipe and a 2-speed tranny. Man, will this car fly! Out of the box, the Nitro RS4 hits speeds in the neighborhood of 20 to 25mph. With a high-performance engine, a tuned pipe and a 2-speed tranny, it will be capable of getting a speeding ticket on the freeway. Just can't drive 55? Well, then, the Nitro RS4 has your name all over it.

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.

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some hot lines and set a blazing pace in the drizzle. He slipped his Mugen away from Furutani. Lett slipped into second early on and pulled out all the stops as he set off after Pavidis. It quickly became the battle of the weekend. The two traded the lead umpteen times, through pit stops, crashes and smooth moves in traffic. Pavidis grew tired of this, and he began to put distance on Lett at the midway point. Then the downhill double started to take its toll. Pavidis clipped it and "endoed" more than once. This required marshalling and caused him to lose his cushion. Soon, Pavidis quit doing the double, while Lett let it fly.

Then, Pavidis' wing mount came loose, and it started flopping around. Not only was it making the car loose on the fast sections, but it was also distracting in the rough. Still, Lett couldn't make a pass and make it stick. They traded the lead a zillion more times, and late in the race, the intensity took its toll on Pavidis. Lett got the advantage and stretched it. Yuichi Kanai tried to sneak up on the Mugen pilot, but Pavidis wasn't about to budge. Lett won with a 141/60:22.16, while Pavidis did 140 and Kanai turned 139. Lett had defended his title because of nerves of steel and finesse learned from his past supercross experience as a Team Yamaha mechanic.

## FINAL THOUGHTS

The '97 West Coast Challenge was a spectacular racing event. Thanks to Kyosho, O.S., Mugen, Associated, Losi, Horizon, Ace Hardware, JR Radios, OFNA and Dynamite. If it wasn't for their generous sponsorship, this race would have never become a reality. Thanks to the staff at Valley R/C Race Park and the entire track crew for their efforts.

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## NITRO STAMPEDE

(continued from page 151)

Traxxas hard-anodized, Teflon™-coated shocks are among the smoothest around. I bolted the shocks right on without any modifications, and the ride height was dead on. Don't you love it when everything seems to work out right from the start? I had to fill the shocks with Trinity\* SOWT oil and install some Traxxas soft Red springs, but that was it.

Next, I installed a set of Lunsford\* Punisher titanium tie rods. They're lighter and much stronger than the stock units. Thanks to Lunsford's optional Punisher adjustment wrench, they also make adjusting camber much easier. I used the 1 7/8-inch-long rods to replace all the upper camber links. I didn't replace the steering rods because they are too long, and Lunsford didn't have any Punisher tie rods in that length. I guess if the demand arises, Lunsford will offer a complete titanium set of tie rods for the Nitro Stampede. In the meantime, I found that the Nitro Stampede handles bumpy terrain better when all four wheels have 2 to 3 degrees negative camber.

Finally, I installed a Traxxas graphite suspension-arm brace between the inner suspension-arm hinge pins. This doesn't increase performance or reliability much compared with the stock fiberglass unit; it's just for aesthetics. The graphite unit is black and matches the rest of the chassis.

### GET MASHED!

Next came the wheels and tires. Again, the stock monster truck tires and cone-dish wheels work great. Of course, I had to be different; I installed a set of HPI\* MT chrome wheels and a complete set of Pro-Line\* Masher tires. The HPI 5-spoke chrome wheels are real showstoppers, but their biggest advantage isn't in the looks department. These wheels have different offsets, and this increases the truck's front width by a full inch and its rear width by a 1/2 inch. The increased width really helps handling, and the truck is now less prone to flipping over. Because of the new offset, I was also able to mount the out-

side steering-rod ball ends underneath the front steering blocks instead of on top of them. This removed some bump-steer from the front suspension and prevented the ball ends from rubbing against the tires during hard cornering.

The Pro-Line Masher tires have an extremely aggressive "V"-tread that excavates dirt like a bulldozer. These tires are also a bit taller than the stock ones, and this increases ground clearance slightly—an advantage on big-wheel monster trucks. Oh, did I mention the awesome sound these tires make when they run on asphalt? A warning: be sure to glue the tires to the wheels with plenty of CA. If you don't, the tires will be thrown off the wheels the moment you goose the throttle.

### ALUMINUM GOODIES

After running the truck just one time with the new powerplant, I realized that a wheelie bar was necessary. The way I have my truck geared, it has plenty of takeoff, and the top end seems virtually limitless. The funny thing is that the truck's front tires will suddenly come off the ground when the engine drops all its ponies into the bucket (usually, when you think the truck has reached full speed). You can't help but wonder where all that power suddenly came from. I think before I run the truck again, I'll install a clutch bell with fewer teeth, because all that top speed really isn't necessary.

I decided to call Eric Sutcliffe at ESP to ask what goodies he might have for this project. The first item he sent me was an aluminum wheelie bar/skidplate (there is a God). The unit has small, foam, model airplane landing-gear tires mounted on an axle. The axle is installed on the skidplate and the whole enchilada is mounted on the Stampede's rear tranny/suspension-arm mount. On this project, this unit has definitely proved to be very useful. In fact, I was thinking of calling Pro-Line/Jaco to see whether they have

foam tires that will fit the landing-gear wheels. After all, the truck's front tires spend so much time in the air that the wheelie-bar tires actually become the truck's rear tires—got foamies in a soft, Yellow compound?

Eric also sent me a really cool aluminum front bumper/skidplate and a couple of RAM\* 9V lights to mount on the bumper. The bumper and lights look great on the chassis, but they add about a 1/2 pound to the truck's weight, and that requires some major spring preload adjustment. Because they're sure to get all scratched up during hard driving, I think I'll remove the lights when I run the truck. I will, however, leave the lights installed when I run in the early evening. I love the smell of nitro right before dinner—yuk!

### SUMMING IT ALL UP

I bet you're wondering how the truck performed after I had installed all the upgrades. Here's the verdict in a nutshell: my Project Truck is much faster, has more torque, runs more efficiently and reliably, handles rough terrain better and looks even nicer than the stock Nitro Stampede. The star of this show, however, is definitely the new TRX Pro .15 engine. I wouldn't be ashamed to install this bad boy on an RC10GT chassis in place of the ever popular O.S. 12 CZ-Z.

In my opinion, the Traxxas engine is just as powerful as, if not more powerful than the mighty CZ-Z! I was also impressed with how well the truck ran with the Pro-Line Masher tires. They squeal when cornering and make that spooled-up whining sound like the real 4x4 truck tires make when they're on the highway. My Nitro Stampede is now even more fun to drive, and I'm certain that I accomplished my goal of building a better monster. I only wish I could figure out a way to build a better driver!

\*Addresses are listed alphabetically in the Index of Manufacturers on page 201.

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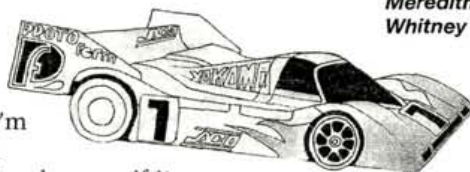


This gallery is dedicated to Ryan Moore—a racer I'll never forget.

## MacSkippy's Gallery

**Y**ou know, if you guys keep this up, I'll have to ... I don't know ... take drastic action! I'll have to come up with the "Gallery" more than twice a year ... or—worse yet!—I'll be forced to start a whole new section in the mag! You don't want to make me do more work do you?

(Now you got me stressin'; I'm really nervous!) Seriously, even if it means no lunch hours, I don't care. I really do love your creativity. Keep it coming!

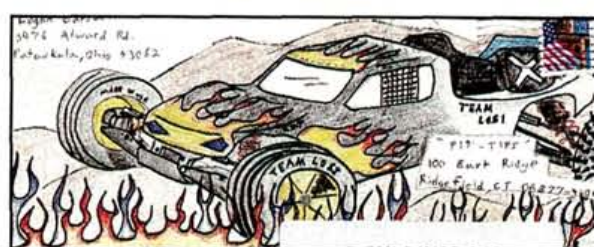


Meredith Alexis Card,  
Whitney Pt., NY

Brian Card,  
Whitney Pt. NY



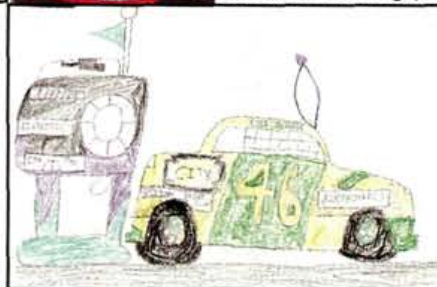
Raymond Bock,  
New York, NY



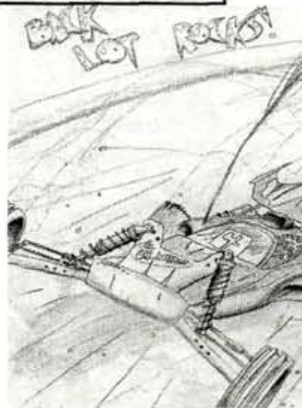
Logan Carswell, Pataskala, OH



Michael Cummings, King, NC



Joakim Macasero,  
Buena Park, CA



Scott Bradford,  
Lancaster, PA



### Dogbone Dilemma

I thought E-mailing you seemed to be the best idea since you seem to know the most. Your Back Lot article is my favorite part of the whole mag. My friend Chris has an RC10CE. He has become so frustrated with the dogbones that now he is going to get out of the hobby. Is there any good way to help keep them in? A week ago, we were looking for new battery packs. I found a 1700 pack at Radio Shack for only \$24. Is it worth buying it? I did not think the cells were too good. Are Trinity packs worth the extra money?

Thanks for your time.

Jeff: SC6230@aol.com

OK Jeff, let me get this one straight. Your friend is going to quit because of dogbones? Wow! What's he gonna do if he's ever faced with a real dilemma? Tell him to get a set of MIP's CV (constant velocity) shafts; they're great and can be rebuilt.

As for batteries, I'd steer you toward packs sold in

hobby shops. Generally, Trinity products are first-rate—especially their cells. They're worth the extra \$\$\$.

Thanks for the support. I surely do appreciate it. CC

### Sore losers are so pathetic

Dear Chris D.,

I read your letter in Chris's Back Lot in the April issue of *R/C Car Action*. Chris is exactly right. There will be as many winners as winners out there to bring you down. Surround yourself with the winners. If there are no other winners, be the winner. And other kids will come to you. Don't settle for being pretty good in second or third. Practice until you beat them every time.

You should also carry this attitude of winning to your school work, job or anything you do. In the long run, you will be the winner in life.

And don't forget to have fun!

Take care,

Dave McWilliams: DaveMcWill@aol.com



A few views from  
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